Evaluation
of

ENERGY MANAGEMENT CONSULTANCY AND TRAINING PROJECT

(EMCAT 386-0517)

February 1996

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ACRONYMS

ADB	Asian Development Bank
ASCI	Administrative Staff College of India
CEA	Central Electricity Authority
CFL	Compact Fluorescent Lights
DFI	Development Finance Institution
DSM	Demand Side Management
EMCAT	Energy Management Consultation and Training Project
FY	Fiscal Year
GOI	Government of India
HCC	Host Country Contribution
IDBI	Industrial Development Bank of India
IPP	Independent Power Producer
MOP	Ministry of Power
MOU	Memorandum of Understanding
MW	Megawatt
OFAP	Operational and Financial Action Plan
PACD	Project Assistance Completion Date
PETC	Pittsburgh Energy Technology Center
PFC	Power Finance Corporation
PLF	Plant Load Factor
PPA	Power Purchase Agreement
PRC	Project Review Committee
PW	Person Weeks
Rs.	Indian Rupee
SEB	State Electricity Board
SGC	State Generating Corporations
TA	Technical Assistance
TOR	Terms of Reference
TR	Training

EXECUTIVE SUMMARY

USAID Mission to India: Energy Management Consultation and Training Project (EMCAT) Midterm Evaluation, February 1996

Project Purpose: Substantial inefficiency in the production and consumption of electricity not only impedes economic growth and development but is a major source of environmental degradation and pollution. The EMCAT project's goal is to improve the efficiency of both energy supply and its utilization in the industrial and other sectors. The purpose of EMCAT is to improve India's technological and management capabilities for the supply of energy and for the efficiency of its end-use by private industry and other sectors.

The EMCAT Project: The mid-term evaluation of the EMCAT project is focused on the following project components:

1) Supply-Side Component: The EMCAT project was designed around 1989/1990 based on the trends and needs of the 1980s. The World Bank, Asian Development Bank (ADB) with $515 million in loans and USAID/India with $14 million in a grant agreed to work together with the relatively new GOI lending agency, PFC, to promote supply-side improvements. Thus, the PFC became the implementing agency for the power supply-side component. PFC was also provided assistance for institutional strengthening. The assistance was to be provided to both PFC and State Electricity Boards. Bechtel Corporation was selected as the contractor for the implementation of supply-side activities of the EMCAT project. The $8.9 million, 4 year contract was executed in March 1993.

2) End-Use Efficiency and DSM Program: The objectives of this component are to promote end-use efficiency in selected energy-intensive Indian industries, and promote conservation and related policy reforms. The project was to help address the main constraints to improved efficiency, assumed to be: 1) widespread dependence on outdated end-use technology, 2) inadequate domestic supply of energy efficiency devices and equipment, 3) shortage of energy efficiency technical capabilities (consultancy, design and engineering), and 4) inappropriate prices and lack of financial incentives in energy efficiency investments.

This component is being implemented through the Industrial Development Bank of India (IDBI). Resource Management Associates (RMA) was contracted for implementation of this component in April 1994 for activities over a three year period. Project-related work and expenditure commenced prior to April 1994 with two major studies funded by EMCAT, "Cogeneration in the Sugar Industry" and "Energy Service Companies"; and numerous small grants and service contracts through IDBI, totaling about 1.34 million in cost. The technical assistance contract was for US$2.563 million.

Evaluation Purpose and Methodology: When EMCAT was originally designed in the late 1980s, the Indian economy and power sector were remarkably different than they are today. The reason for this evaluation is to increase the ability of the EMCAT project to actively and decisively support the power sector reforms, thereby increasing the sector's efficiency and reducing environmental pressures, and to look afresh at the role of Indian institutions in helping EMCAT facilitate this process in light of the major changes in both the economy and the power sector.

This mid-term evaluation is intended to provide findings, conclusions, recommendations and lessons learned from an analysis of EMCAT. The key concerns to be addressed are: a) the relevance of the project to achieving EMCAT objectives and need for changes, particularly in light of the enormous

changes which have taken place in the economy and the energy sector since the project was designed; b) the effectiveness of the project in meeting objectives; c) cost-effectiveness with respect to alternatives for meeting project objectives; d) the impact achieved with respect to indicators in the Logical Framework matrix for the project; e) the sustainability of the impacts of the project; f) the adequacy and reliability of the Host Country Contribution; and g) consideration of extension of the PACD.

The mid-term evaluation of the EMCAT project has taken place almost entirely in India, and is a highly field-oriented review of the origin, progress, status and potential future directions of the project. Focused interviews, in key cases guided by questionnaires, have been used to supplement a review of project progress and technical reports. The team has been divided into two parts paralleling the structure of the EMCAT project, Power Supply and End-use Efficiency. In keeping with this natural division by contract, the major findings and recommendations are presented below for each component separately.

EMCAT Efficiency/Demand Side Management Component

Major Findings and Conclusions:

1. The project objectives and activities are still relevant but there is a need for several changes and adjustments.

Inefficiency in industrial power consumption is still a major problem in India and project components such as DSM appear capable of making a significant contribution to improved sector efficiency. Other project activities such as support for improving industrial efficiency and promotion of ESCO's, are contributing to both increased institutional and expanded technical capability. Nonetheless, significant fine-tuning will be needed to make them more effective and revise scope. For example, energy audits and other efficiency technical assistance have not been effectively delivered either in training or in loan portfolio development for the IDBI.

2. The organizational structure of this EMCAT component and IDBI's role remain appropriate.

The two main institutional linkages for energy efficiency are with the IDBI and Ahmedabad Electric Company (AEC). IDBI provides an excellent linkage with the financing-side "constraint" to efficiency investment, while AEC is an excellent link with a private sector utility. Even though EMCAT is focused on introducing efficiency in the industrial sector, there is a weak linkage with the industrial "customer."

3. Several project activities, particularly Demand Side Management (DSM), have been effectively implemented, but there is room for improvement in other areas.

EMCAT activities in DSM with the Ahmedabad Electricity Corporation (AEC) have been carried-out effectively and with a great deal of enthusiasm by AEC and the contractor. EMCAT has identified significant efficiency opportunities in energy intensive industries, but its recommendations have not been implemented due to inadequate depth of studies and promotion of results. Several new Indian ESCO's and U.S.-Indian joint ventures have been established due to the project. However, the traditional ESCO market in efficiency investment is currently weak. The market for joint-ventures in smaller scale power generation appear more appropriate but the project has not yet assisted in exploring these.

4. With regard to sustainability, the project has mixed results.

Both the ESCO and DSM activity appear to be sustainable. However, under the current system possibilities for DSM replication are quite limited. Energy auditing and LPD activities are not being implemented in a sustainable manner.

Recommendations:

1. The relevance and effectiveness of efficiency activities have been demonstrated, and promise significant impacts. Therefore it is recommended that the RMA contract should be extended for at least 1 year. Resources should be added to maintain a 3rd year and 4th year level of effort equal to the project's 2nd year. This is a qualified recommendation as redirection and refocus will also be required in the following areas: a) Greater involvement of sector-specific industry associations and industry "service" entities (e.g. NPC-National Productivity Council) is needed to help address weak linkages; b) The role of U.S. technical assistance should be rethought and limited to inputs where there is a high value-added (for example, where unique technology or expertise resides in US experts), with local coordination and technical support increased; and, c) An explicit programmatic linkage to environmental initiatives, as well as to market-driven modernization, better leveraging overall EMCAT funding with other donor programs, and similar factors, should be built into program design.

2. The EMCAT DSM program should give greater attention to DSM options at AEC with large-scale potential for peak demand reduction or conservation such as energy efficient lighting systems. For example, assistance by RMA to evaluate technical and non-technical barriers to efficient lighting within the AEC system, and AEC demonstration of technology and dissemination methods.

3. Due to the critical importance of innovative financing and promotional efforts in achieving DSM changes, EMCAT should give more emphasis to developing practical and effective financing and promotional schemes such as utility and third-party financing and installation.

4. Additional LDP studies currently planned should be reoriented, redesigned and rebudgeted to provide specific outputs which strongly support the process of producing a bankable project.

5. LPD studies should only be performed where they are part of a clear strategy to achieve investments. All studies should be personally presented to company management to stimulate favorable decisions by RMA consultants, plus local consultants and IDBI.

6. EMCAT should continue limited ESCO support and promotion. EMCAT should facilitate interchange of information on experiences, identify constraints, whether market, legal or technical, and assist where appropriate in addressing these.

7. Local staffing roles and capacities should be rethought to provide for improved high-level coordination between IDBI and RMA, need for better networking with other donors and projects, and improved development and implementation of a strategy for sustaining and disseminating EMCAT outputs.

Lessons Learned:

Success in DSM depends as much on the motivation and accountability of utility management as it does on the cost-benefit and technical feasibility of DSM measures.

DSM efforts will only be effectively replicated in public utilities which disaggregate distribution operations and financial responsibility into manageable and accountable units. The priority need to implement DSM is a strong argument for such structural reform.

Market forces are the major factor in industry energy efficiency and DSM investment decisions.

Decisions on energy efficiency investment is largely the result of market forces, making technical understanding of efficiency opportunities a necessary but not a sufficient condition for effective conservation. Promotion efforts must focus on reaching senior management, understanding market forces affecting firms, and adapting efficiency investment to complement other priorities.

Good projects alone are not sufficient for results. There must be a way of informing others.

DSM is a sound investment not only for the electric utility but also for the utility customer. Since utility customers face many financial, technical and other constraints, however, it is not sufficient to demonstrate the financial benefits and effectiveness of DSM measures. Successful dissemination of DSM initiatives requires innovative and non-conventional consumer marketing and financing approaches to be successful.

EMCAT Supply Side Component

Major Findings and Conclusions

1. The objectives and many of the tasks of the project remain valid despite significant changes in the energy sector. However, the assumptions regarding the appropriate project vehicle (Power Finance Corporation (PFC)) are no longer valid.

Inefficiencies in the production and consumption of electricity still abound in India. Yet, many changes are occurring in the power sector and they are precisely those changes which it was envisioned that PFC could help bring about. Thus, project assistance was targeted primarily at and with PFC. Yet, contrary to the project design assumption, change has not occurred because of PFC. The necessary reforms take place because the State politicians and bureaucrats have no other choice.

PFC has no doubt been important in sparking new ideas and, through EMCAT assistance, in enabling key decision makers to see new ways of approaching their problems. The OFAP process has also been important in helping to bring some discipline to decision making and by providing SEB officials some guidelines and benchmarks for performance. PFC will continue to be an important tool in accessing senior electricity decision makers in the States and helping to focus them on new ideas.

2. This component has great potential to assist in meeting India's power needs. However, meeting all of the planned outputs may mean achieving none of the objectives.

The project design was too ambitious by trying to offer assistance in a very wide range of subjects with very limited funds. Reaching the outputs of numbers trained and studies conducted would mean assistance was spread very thinly. Yet, the material which must be covered is new and detailed. To effectively benefit from this material participants must have more and, perhaps, repeated assistance. There is a need to focus on important topics. More assistance in a few areas is needed rather than a little assistance in many areas.

3. IF EMCAT activities are to meet their objectives, then a large portion of EMCAT assistance must be targeted directly at reform minded State Electricity Boards (SEBS).

The assistance under EMCAT is to provide institutional strengthening at PFC and to assist in meeting Utility needs for increasing efficiency. In the past assistance has been provided to all SEBS meeting the OFAP conditionality. In many cases the assistance would not directly contribute to efficiency as the participants were unable to put what they had learned to work in their SEBS. Skills can be provided but there must also be an opportunity to practice those skills, which will take place only in reforming SEBS.

4. Training in the US is not cost effective if it does not impart something unique to the US experience.

Thus far, US training has not imparted unique skills or experience which could not be otherwise imparted in India. This being the case, more persons could have been trained in India with the same amount of resources, or the same number of participants trained with fewer resources.

5. Effective assistance requires sound planning, strong management, and close cooperation among all parties.

The team found that the project suffered from a lack of long range planning, weak management of activities, and very little constructive dialogue. It should be noted that this appears to be turning around with the appointment of a new Chairman at PFC and a new Bechtel resident advisor.

6. As the project was designed, no provision was made for sustainability.

Recommendations

1. USAID should obligate the remaining $5 million for this component.

The EMCAT component has the ability to address critical and pivotal needs as India reforms and restructures its power sector. The areas of assistance designated in project design are relevant, important and unmet by other donors or lending institutions. Current assistance by the World Bank, ADB and other donors has failed to provide for all the needs of reforming SEBs and, in the expert opinion of the team, many of these unmet areas are of prime importance. They are also areas for which EMCAT was originally designed.

2. The project structure needs major changes for these funds to be effectively used.

To make assistance more effective the following changes are recommended: a) The contractor should work with the end user directly rather than working through PFC. This means that for assistance which is directed at SEBS, the contractor should work directly with and for the SEBS. For assistance aimed at institutional strengthening at PFC, the contractor should work directly with PFC. b) The client must review and comment on the work product in a timely manner. c) There must be more and clearer communications among all parties. d) Assistance at the SEB level is to concentrate foremost on the needs of reforming SEBS; however, this does not preclude other SEBS from participating on a space available basis. e) While the GOI and USAID negotiate the focusing of EMCAT, there are activities which should carry on such as completion of the Hydro PPA, Scoping Paper and Background Research on Bulk Tariffs, and the standardization of the PFC loan application. f) The technical assistance and training should become sustainable and replicable by bringing an important training institution such as ASCI into the

process; and, h) US training and the US based training coordinator should be replaced by training and a local training coordinator in India.

3. The remaining funds should be divided between the PFC, ASCI and a few SEBS.

Funds directly for PFC should support the training and technical assistance which is needed for PFC institutional strengthening. A loose division would be on the order of 20% of remaining funds being committed to PFC's institutional strengthening in the areas of banking, policy studies and information resources. Support to SEBS would be focused on those SEBS which are in the reform process such as Haryana, Andhra Pradesh, Gujarat. Broad priority areas for training and technical assistance are: (1) Banking related Technical Assistance and Training; (2) Policy Studies; (3) Human Resource Management; (4) Bulk Tariffs; (5) Competitive Bidding Support; (7) Establishment of Profit Centers and related accounting activities; (8) Regulatory Support; and (9) R&M assistance.

Lessons Learned

Major change in the way government does business comes about not because of outside forces. It comes about when the players realize that they have no alternative other than to reform the system.

In the design of this project it was thought that the carrot of PFC lending coupled with EMCAT assistance would be sufficient to induce major changes in the State Electricity Boards. It was not! The team's findings and interviews support the view that the SEBS change only because they have no alternative. When they have reached this point, it is the appropriate time for money and assistance - not before.

It is more effective to provide a few areas of assistance and to do so intensively than to provide a wide spectrum of assistance with limited funds.

The EMCAT project targeted more problems for assistance than it had funds to commit to those problems. For training this meant that no retraining or refresher courses were anticipated. Transferring new skills, particularly managerial and organizational skills, often requires intensive and repeated application. Without this concentrated effort, as it were, assistance can only acquaint, not upgrade or furnish participants with much needed skills. The end result is a group of participants that may remember concepts but does not have the depth or experience to apply them. This type of assistance is not effective.

Assistance may change minds but it is has little impact if the minds it changes are not in a position to use that knowledge for change. Provide assistance where it can be used immediately and make provisions for its replication and sustainability so that later other groups can benefit when they are receptive.

An often quoted major benefit of the EMCAT assistance has been that it changed the way participants saw their problems and gave them a new way of solving those problems. This may, indeed, be true. However, if the political system those participants work in is unwilling for change to take place, then the assistance may be wasted. This is particularly true when one considers how often bureaucrats are transferred to different departments in the Indian system. They may be transferred out of electricity and in to health, for example, long before their governments are willing to make important changes. Providing them assistance rarely can make an impact. Rather, limited assistance should be provided

where it can be used immediately and project design should make provisions for its replication and sustainability so that later other groups can benefit when they are receptive.

Problems may appear technical in nature but are really the result of poor management and organization.

Those that design and implement projects often assume that the problems they see are technical in nature. In the subcontinent this is not normally true. For example, upon visiting thermal power plants with very low plant load factors, technical factors such as leaking steam valves are often identified. This then focuses the project on providing assistance towards technical solutions. In truth, the engineers know the technical solutions but poor management or organization often prevents them from addressing these problems. If assistance is to have a lasting impact, it must address on a priority basis managerial and organizational concerns, not technical.

GENERAL PROJECT RECOMMENDATIONS

1. Project Assistance Completion Date

It is recommended that the project be extended to December 31, 1999. The project addresses key problems in India's energy and environmental future and, if properly focused, will fill the gap at reforming SEBs. World Bank, ADB and other assistance has not filled all needs even at a single reforming SEB. To make the successful transformation from a state owned and operated utility to the private sector requires many significant and delicate changes. USAID is addressing or can address areas which are critical to the reform process and which have not been funded by other donors or lending institutions. USAID's assistance can be the pivotal assistance, albeit small in total dollar contribution.

2. Manage EMCAT Components as if they are activities under one project rather than separate contracts.

The four separate contracts have much in common and will contribute to the SEBs in four distinct areas, including the renewable energy contract. But it is important that they have a unified approach. This will avoid duplication and lead to measures which reinforce each other's activities. To assist in this unification, USAID needs to start managing the contracts as one. Project meetings should be conducted on a routine basis jointly with the contractors rather than separately.

3. There is a need for strengthening USAID's role of supervising and supporting EMCAT project activities, particularly in the area of reviewing the Contractors services.

4. It is recommended that the remaining funds for the IDBI and PFC components be obligated.

5. More effort must be given to dissemination of project activities. The project could establish a quarterly newsletter which is circulated to the power sector. The newsletter could cover a wide variety of topics and be used to acquaint readers with project activities and any other relevant activities of the SEBs, industry participants and interest institutions.

6. A representative of ASCI should become a member of the Project Review Committees in order to ensure that sustainability and replicability concerns are addressed at this level.

PROJECT IDENTIFICATION DATA SHEET

1.Country: INDIA

2.Project Title : ENERGY MANAGEMENT CONSULTATION AND TRAINING
3.Project Number: 386-0517

4.Project Dates:

a. First Project Agreement: June 28, 1991
b. Final obligation date: FY
c. Most recent Project Assistance completion date (PACD): March 31,1997

5. Project funding:

a. A.I.D. Bilateral Funding (grant)	US$ 17.0 million
b. Other Major Donors	None
c. Host Country Counterpart Funds	US$ 5.668 million

6. Mode of Implementation: USAID direct contract with:

BECHTEL Corporation, Resource Management Associates and K&M Engineering

7. Project Designers: Govt. of India
Power Finance Corporation,
Investment Development Bank of India.

8. Responsible Mission Officials

a. Mission Director(s) : WALTER G. BOLLINGER,
LINDA E. MORSE.
B. Project Officer(s) : N.V. SESHADRI

9. Previous Evaluation(s) : None previous

SECTION 1: EMCAT PROJECT BACKGROUND

A. Power Sector Background

The Indian power system manifests characteristics of both developed and developing countries. Whereas availability of human resources and adoption of power technologies are more comparable to those of the former, the reliability, quality and access to electricity supply and the level of network losses are more akin to those of the latter. Until 1991, the responsibility for operating and developing the Indian power system was vested to both the Central and State levels of Governments. The State Electricity Boards (SEBs) are vertically integrated electric utilities established under the Electricity Supply Act of 1948. The Indian power sector, comprising 81,164 MW of installed capacity in the public sector (captive power is over 10,000 MW) falls miserably short of the country's needs. About two-thirds is lost or unavailable due to shortage of coal, transmission and distribution (T&D) bottle-necks, poor maintenance, inadequate maintenance and massive electricity thefts. The SEBs are inefficient, outsized and chronically in debt. In 1993-1994, the last year for which figures are available, SEBs collectively drained Rs 10,700 crore (about US$ 3 billion) in subsidies of which about Rs 8,300 crore (about US$ 2.8 billion) went towards subsidizing the agricultural sector. This poor performance is attributable to resource constraints precipitated by a combination of factors which include: 1) the overlapping roles of the Government as both owner-operator and regulator; 2) lack of SEBs financial and administrative autonomy and, in turn, accountability; and 3) inadequate adjustments in tariffs and the resulting deterioration in the SEBs financial performance, including the ability to mobilize financing from internal sources.

B. USAID/India Energy Initiatives

To help restore financial viability of SEBs and redress the past imbalances in power sector development, the GOI established the Power Finance Corporation (PFC) in 1986 for the purpose of mobilizing local and foreign capital for on-lending to the SEBs. This institutional arrangement established PFC in a leadership role. As first step toward that end an Operational and Financial Action Plan (OFAP) defining all aspects of SEBs operations was adopted as a pre-requisite for access to PFC funds. To assist PFC in its role, USAID/India developed the EMCAT project supply side component. The EMCAT project's purpose is improved environmental and financial sustainability in the power sector through two EMCAT program components: 1) increased efficiency in power generation, transmission and distribution (supply-side efficiency improvement component); and 2) end-use efficiency improvement in targeted sectors and industries (demand-side efficiency improvement). In addition to the direct economic benefits of improved energy efficiency, such as lower energy costs, reductions in foreign exchange expenditures for imported hydrocarbons, and increased industrial competitiveness resulting from lower production costs, there are benefits from the reduction of environmental problems, including global climate, deforestation, and air and water pollution.

Other USAID/ India programs include the following energy related activities:

1. Renewable Energy Activities - The program includes: a) the Renewable Energy Commercialization Project being implemented through the Renewable Energy Project Support Office ; and, b) the Greenhouse Gas Pollution Prevention Project - Advanced Bagasse Cogeneration Component.

2. Energy Efficiency Activities - Asia Sustainable Energy Initiative;

3. Clean Coal Technology - a) Greenhouse Gas Pollution Prevention Project, Efficient Coal Conversion Component; b) Indigenous Coal Preparation Program.

4. Energy Infrastructure and Technology - the program components are: a) Support for Environmental Technology Development; b) Program for the Acceleration of Commercial Energy Research; c) U.S. - Asia Environmental Partnership; and d) Energy Training Program.

This mid-term evaluation focuses only on the two principal components of the EMCAT project. It excludes the following EMCAT project activities: i) renewable energy component; ii) model power plant life assessment study conducted through a PASA, executed with the PETC of the U.S. DOE; iii) local technical assistance and training through Indian institutions under the energy supply component; and iv) commodities procurement for PFC.

C. EMCAT Project Components

The mid-term evaluation of EMCAT project is focused on the following project components:

1) Supply-Side Component: The EMCAT project was designed around 1989/1990 based on the trends and needs of the 1980s to improve the efficiency of power supply, including transmission and distribution system. The World Bank, Asian Development Bank (ADB) with $515 million in loans and USAID/India with $14 million in a grant agreed to work together with the relatively new GOI lending agency PFC to promote supply-side improvements in the SEBs, including training and technical assistance. Thus, the PFC became the implementing agency for the power supply-side component. The project also provided technical assistance and training to the PFC to strengthen its institutional capabilities. The technical assistance and training were to be provided to both PFC and SEBs. The Bechtel Corporation, a United States consulting firm, was competitively selected as the contractor for the implementation of supply-side activities of the EMCAT project. The technical assistance (TA), training (TR) and study tours (ST) are provided under the Bechtel EMCAT Support Project (BESP) which was executed in March 1993. The $8.9 million contract was for a period of four years with the following components:

a. Institutional Strengthening of PFC: a) PFC reorganization study; b) Manpower requirement study; c) Preparation of investment planning and project appraisal manuals; d) preparation of technical manuals; e) information system requirement analysis (MIS) and its implementation; f) training in India and United States; g) workshops and study tours; h) policy studies; and i) establishment of a document center and procurement of audio visual equipment.

b. Institutional Strengthening of SEBs and SGCs: a) Needs assessment for training and technical assistance; b) assistance in carrying out diagnostic studies for preparation of OFAPs and their implementation; c) plant life extension TA; d) identification of critical areas for training in India and United States and technical assistance to SEBs and SGCs for upgrading their skills; and e) organizing training programs, workshops/seminars in India on a regional basis in such areas as billing, metering and collections, T&D loss reductions, proper tariff formulation, etc.

2) Private Power Development: After the GOI economic reform program in 1991, and subsequent amendment of the Electricity Supply Act (1948) to allow private sector participation in power generation and distribution, additional resources were allocated under the EMCAT project for technical assistance to SEBs, PFC and central government agencies to develop institutional capabilities to evaluate, select and implement IPP investments. K&M Engineering & Consulting Corporation was selected to provide technical assistance in areas such as: private power security packages; private power financing options; to organize study tours; procurement of computer commodities; and, provide the services of a long-term resident advisor. The contract was executed in April, 1995 for a period of two years to provide 60 person

weeks of technical assistance and 40 person weeks of study tours to the United States and procurement of $60,000 of U.S. commodities.

A total of US$16 million was budgeted to the PFC for the two components of i) supply-side efficiency improvement activities (Bechtel contract) and IPPD program (K&M Contract). Out of the US$14 million allotted for the supply-side contract, an amount of US$9.81 million(70%) was obligated and an amount of US$6.4 million(45%) was spent, indicating that a major part is committed and about half the amount was in fact spent. In the case of the IPPD, out of US$2 million, an amount of US$1.19 million(60%) is obligated and an amount of US$0.53 million(26%) was spent.

3) End-Use Efficiency and DSM Program: The objectives of this component are to promote end-use efficiency in selected energy-intensive Indian industries, and promote conservation and related policy reforms. The project was to help address the main constraints to improved efficiency, assumed to be: 1) widespread dependence on outdated end-use technology, 2) inadequate domestic supply of energy efficiency devices and equipment, 3) shortage of energy efficiency technical capabilities (consultancy, design and engineering), and 4) inappropriate prices and lack of financial incentives in energy efficiency investments.

The EMCAT end-use component is being implemented through the Industrial Development Bank of India (IDBI), the leading Indian development finance institution. Resource Management Associates (RMA) was contracted for implementation of this component in April 1994 for activities over a three year period. Project-related work and expenditure commenced prior to April 1994 with two major studies funded by EMCAT, "Cogeneration in the Sugar Industry" and "Energy Service Companies"; and numerous small grants and service contracts through IDBI, totaling about $1.34 million. The technical assistance contract was for US$2.563 million.

Of the budgeted $6 million LOP for the component, $3.9 million is obligated, and $2.1 million remains unobligated. Of obligated funds, $2.44 million has been spent. A significant amount of funds therefore remain which can be obligated, and/or redirected or reprogrammed. A host-country contribution of US$2.0 million, was budgeted, the majority of which was for Loan Portfolio Design or $1.012 million ($421,000 for consultancy, and $240,000 information dissemination, plus miscellaneous and inflation and contingency).

The new Renewable Energy Commercialization Component has a proposed LOP of $5 million. Since implementation of this component began in late 1995, it was not covered under the evaluation.

D. Options for New Initiatives

The 14th Electric Power Survey prepared by CEA in 1991 envisaged additional generating capacity requirements of 142,000 MW over the next three, 5 year planning periods. CEA has projected an additional generating capacity requirement of about 57,000 MW for 1997 - 2002 and about 67,000 MW during the 2002 - 2007 period. The lack of credit worthiness of most SEBs and the scarcity of funds to finance new capacity addition is well understood by the GOI. This set the stage for the private sector participation in electric power generation and distribution projects. In addition, there is also an urgent need for the rehabilitation, modernization and life-extension of existing plants. In August, 1991 the Electricity Laws were amended to allow for private sector participation. Again during January and August of 1994 additional amendments were introduced for providing flexibility to the SEBs in negotiating Power Purchase Agreements (PPAs). To attract private investment for new generation projects, in March 1992 an attractive two-part tariff structure was announced which allowed recovery of

full fixed charges and with 16 % return on equity at 68.5 % plant load factor. At present, 16 IPPs totaling 9,895 MW qualified for the first batch of fast track projects. Another 31 IPPs involving 22,744 MW could become candidates for the second batch of projects.

In line with the country's liberalization policies in other sectors, a few SEBs have started restructuring and reform studies are underway. A few state governments have decided to take the necessary steps to distance the power industry from direct state government control, and to provide it with the operational, managerial and financial autonomy required for the industry to operate along commercial principles and gradually enable it to access capital markets. Orissa State Legislature has already passed a Reform Bill for the separation of generation, transmission and distribution and the establishment of an independent regulatory agency to promote efficiency and accountability in the power sector. Similar initiatives are in different stages of progress in Haryana, Gujarat, Rajasthan, Uttar Pradesh, Andhra Pradesh and Bihar. Many SEBs recognize that given their own financial constraints, the only feasible way to increase and improve electricity output is to obtain external financing. Without sweeping changes, the SEBs will not be able to attract private investment; additionally, addressing investors' concerns requires tariff, regulatory and structural reform.

The remainder of the EMCAT supply side project activities can be instrumental in accelerating the implementation of structural reforms and IPP initiatives, particularly in the areas of training and institutional development of restructuring utilities and regulatory agencies. Sweeping changes have occurred in the Indian economy in general and the power sector in particular since the EMCAT project was originally conceived and designed. Many institutional and regulatory problems have come into sharper focus. Equally, many solutions have emerged on the horizon.

SECTION 2: EVALUATION

A. Evaluation Rationale

A midterm evaluation typically seeks to answer the questions of whether the project outputs are being met in a timely and satisfactory manner and what unanticipated factors are important in influencing progress. The midterm evaluation also attempts to recommend possible midcourse corrections. Thus, it is an important tool for both the contractor and USAID in providing an objective, external view of the project's progress, roadblocks and suitable correction factors. It is by its very nature backward looking. However, the mid term evaluation of the EMCAT project goes beyond the typical evaluation process and seeks to answer a different set of questions.

When EMCAT was originally designed in the late 1980s, the Indian economy and power sector were remarkably different than they are today. The reason for this evaluation is to increase the ability of the EMCAT project to actively and decisively support the power sector reforms, thereby increasing the sector's efficiency and reducing environmental pressures, and to look afresh at the role of Indian institutions in helping EMCAT facilitate this process in light of the major changes in both the economy and the power sector.

This mid-term evaluation is intended to examine, within the context of current energy prices and GOI policy, as well as completed or ongoing efforts of other multinational and bilateral agencies, the project's: 1) current relevance and need for changes, 2) progress to date and any potential redirection which may enhance its impact, 3) cost and benefits relative to implementation alternatives, 4) impact to date, as well as better means to measure future impact, 5) sustainability of impacts, 6) host country contributions and 7) determine if extension of the PACD is warranted, and by how long. The Evaluation Statement of Work is included as Appendix I.

B. Team Composition

The team was composed of four full time evaluators with extensive experience in all aspects of electricity and energy efficiency and one part-time advisor, a former GOI Secretary of Power, to provide the background and in-depth institutional aspects of power supply and efficiency in India. Two members focused on the supply side component while two members worked on the energy efficiency/DSM component. They were:

Supply Side Component -

Matthew W. Addison (Team Leader) - Energy and Environmental economist with over fourteen years of experience in economic analysis in energy and environment, energy policy & planning, restructuring & privatization, project feasibility and evaluation, and environmental valuation. Mr. Addison has worked in Brazil, the Czech Republic, Hungary, India, Indonesia, Pakistan, Saudi Arabia, and the UAE.

Shibu Dhar - Electrical power engineer with over 25 years experience in power system planning and environmental impact evaluation of power facilities in the USA and developing countries such as India, Cambodia and Central America.

Energy Efficiency and Demand-Side Management Component-

Mike Jones - Energy Economist with over 20 years of experience throughout Central and South American and Africa in energy planning, electric utility regulation, economic analysis and project management and evaluation.

S.V.R. Rao - Specialist in quantitative techniques with over 23 years experience in planning and implementation of electrification and energy conservation projects, 22 years experience in industrial consultancy in India.

C. Evaluation Methodology

The mid-term evaluation of the EMCAT project has taken place almost entirely in India, and is a highly field-oriented review of the origin, progress, status and potential future directions of the project. Focused interviews, in key cases guided by questionnaires, have been used to supplement a review of project progress and technical reports. The team has been divided into two parts paralleling the structure of the EMCAT project, that is, first, Power Supply, focusing on the project component implemented by PFC thru Bechtel Corp. and K&M, and second, End-use Efficiency, focusing on the IDBI and RMA implemented activities.

EMCAT supply and demand teams conducted interviews in New Delhi, Orissa, Haryana, Bombay and Ahmedabad, over the period January 8 - 23, 1996. A USAID mission briefing on both lessons learned and preliminary findings were completed on 24 January, with the Team Leader finalizing the team report, and incorporating comments prior to departure February 6. Entrance and exit briefings with USAID were used to ensure close mission involvement, and USAID staff attended many of the key meetings, particularly those where policy issues were discussed.

EMCAT supply side interviews, questionnaires and report review has focused on defining the critical issues in the power sector, and the role of both the project and PFC in attempting to address these with EMCAT's remaining funds. Particularly important has been an assessment of the power sector structural reform process and other critical power sector issues including plant rehabilitation, transmission and distribution losses and private power supply initiatives.

The EMCAT end-use efficiency evaluation team conducted interviews, applied questionnaires and reviewed project reports, work plans and records. This was done, first, in order to update understanding of energy sector efficiency problems and issues, including government policy. Second, in order to evaluate the performance of the project in addressing its original goals, and the extent to which it had been or needed to be redirected. The evaluation has emphasized focusing EMCAT end-use efficiency efforts to produce tangible and sustainable results within the project's lifetime. This included identifying policy issues affecting effectiveness of USAID's efficiency efforts, as well as post-project sustainability, for example, greater incorporation of and collaboration with Indian technical and organizational capacity outside of EMCAT such as the National Productivity Council, as well as other donors.

The evaluation team has addressed the following questions prescribed by USAID:

Relevance: Current relevance given the changes in the Indian power sector and energy prices and policy of the past four years, including potential modifications.

Effectiveness: Effectiveness with which project-sponsored activities were carried-out and the extent to which they reached the intended original and other appropriate target groups, namely PFC, IDBI, SEB's, private utilities, energy intensive industries, energy engineering and audit firms which were to be primary beneficiaries of this project.

Efficiency: The overall economic and financial cost-benefit of the project, that is, net benefits in improved utility generation, transmission and distribution efficiency and decreased need for new capacity, reduced losses, etc.; and energy end-use efficiency improvements in targeted firms. Efficiency was addressed primarily in qualitative terms in this evaluation. The final evaluation however, should perform a quantitative analysis using data derived from log-frame verifiable indicators. (Appendix II presents the project component logical frameworks.) Economic impacts will include such factors as increased quality or reliability of supply, for example, decreased outages and improved voltage regulation for electricity, as well as environmental benefits.

Impact: Impact of the project in terms of Logical Framework indicators, and proposed revisions in indicators.

Sustainability: Prospects for sustainability of the projects impacts beyond the project completion date.

Host Country Contribution: Review of the adequacy and reliability of such contributions.

Project Assistance Completion Date: Review current PACD of March 31st, 1997 and propose appropriate changes.

SECTION 3: EMCAT END-USE EFFICIENCY COMPONENT

A. Project Outputs and Achievements to Date

Category	Target	Achievements
Loan Portfolio Development	**RMA 15**-Detailed Sectoral Industry Studies	20 general survey studies, not detailed.
	IDBI-30 Detailed Sectoral Industry Studies	Unclear if RMA plans 12 additional studies; & if IDBI plans own studies
Private Sector Consulting		
- Promotion of ESCO Concept	- Formation of at least 1 ESCO	5 firms have or are about to enter market
Energy Audit Improvement	- Energy audit training of 70 private engineering consultancy firms.	74 trainees by RMA plus 20 by NPC. 15 trainees to US for advance training.
	- 50 audit firms provided diagnostic instruments for energy audits.	23 firms supplied equipment, apprxly $300,000.
- Pilot DSM Studies	- Implement 1 pilot DSM project*	DSM program implemented in AEC.
- Cogeneration	- Establish 3 units & visit	Cogeneration dropped at USAID direction
- Policy oriented studies	- Conduct & disseminate series of studies	Cogen. studies dropped, 1 tech.econ study; 2 Bus. Focus reports.
Information Dissemination		
- Energy Efficiency Workshops	- Conduct at least 50 workshops or seminars on awareness nationally (Revised in workplan to 1 regional & 1 national)	1 reg. wkshop & 1 nat'l seminar planned for yr 3. 1 ESCO & 1 Audit training totally 26 persons.
- U.S. Study Tours	- No target in log-frame (Workplan has 3 tours)	ESCO trade mission to India
- Trade Missions to India	- No target in log-frame (Workplan has 2 missions)	No business association outputs
- Local Business Associations	- 10 business associations strengthened to provide energy services & promote reforms.	Cogeneration workshops dropped at USAID direction

B. Relevance

1. DSM offers a potentially very cost-effective means to both manage peak electrical demand and minimize the need for new capacity, as well as a means to facilitate conservation of electricity.

The principal goal of the EMCAT DSM component is to stimulate the design, development and implementation of a system-wide Indian DSM program which can leverage development bank funding (both for the utility and for the consumer community and intermediaries). DSM support to Indian utilities is highly relevant given the severe power supply and reliability problems being experienced in India today. DSM has not been practiced in India, and it appears that very little local experience exists. U.S. utility experience is extensive in DSM, offering a good match of successful experience, technical expertise and hardware for India.

2. The Loan Portfolio Development (LPD) activity is relevant to EMCAT objectives and is potentially very beneficial to the mobilization of IDBI funding through the stimulation of bankable projects.

The activity was to begin with a broad strategic study of efficiency opportunities in energy-intensive industry. Detailed prefeasibility studies were to follow to support and help stimulate "bankable" projects loans. IDBI revised initial LPD direction, moving directly to undertake studies with specific firms known to IDBI within energy-intensive sectors.

3. There is a clear need for energy efficiency investments in industry and Energy Service Companies (ESCO's) are a relevant vehicle to bring this about.

ESCO's are a potentially important private sector vehicle to stimulate sustained efficiency and other complementary energy supply investments. This concept cannot be directly transferred from the U.S., and must evolve and be tailored to Indian market needs, business practices and industrial structure.

4. Advanced energy audit assistance is relevant but basic auditing is not.

EMCAT energy audit training under the RMA contract has involved basic audit training in 4 Indian sites, Calcutta, Puna, Madras and Delhi, as well as so-called 3 week "advanced" audit training in the U.S. The audience in both cases was energy audit firms, with some industries also represented. The orientation of the first course was toward basic auditing, a skill which is available widely available in India. This type of audit stresses low-cost and normally self-financing investment, not medium to major capital investments. Such efficiency investments appear to be a mismatch with the interests of IDBI, which is focused on large-scale efficiency investment. The focus of the advanced course which trained 15 auditors for 3-weeks in the U.S. was more relevant to project objectives, that is, it promoted private energy audit business in India, transferred specialized skills, and increased awareness of U.S. audit technology, audit equipment and efficiency equipment. Also more relevant was a six-month audit training course sponsored with NPC at its Madras training center organized earlier under EMCAT sponsorship. Survey and assessment of the adequacy of Indian audit and efficiency equipment was a very relevant activity.

C. Effectiveness

1. The EMCAT DSM program is very effective.

This component is focused on a pilot demonstration program with Ahmedabad Electricity Company (AEC). The program involves: 1) definition of load and market research activities, 2) design and implementation of a DSM Pilot Program, and 3) development and implementation of a 5-Year Action Plan for AEC. This effort began almost immediately with the selection of AEC. This utility was a very sound choice as it is a private utility and had strong incentives to participate in this program. AEC is a relatively small utility, with a peak demand of about 540 MW. There are only 5 private utilities in India. AEC currently has a poor load factor[1] and while generating a significant proportion of its own needs, is forced to buy much higher (about 50%) cost power from the Gujarat Electricity Board (GEB) to serve peak loads.

AEC and RMA have ranked DSM measures for the 5-year pilot program and selected seven areas for incorporation. These are: 1) Industrial Audits and Feasibility Studies, 2) Residential Customer Education and Energy Audit, 3) New Construction Education, 4) Interruptible Tariff for Large Commercial and Industrial Customers, 5) Backup Generator Peak Control Programs, 6) Commercial Retail Store Demonstration and 7) Direct Load Control for Flour Mills.

This DSM pilot program has thus far been very effective due to a combination of: 1) AEC top management support and 2) substantial follow-up by RMA in U.S. specialized technical assistance. For this activity AEC has allocated about 520,000 rupees ($17,300) in the current year and plans expenditures of 1,110,000 rupees ($36,700) in 1997. AEC has also assigned motivated senior staff (5 professionals) and junior staff (2 technicians), and has provided critical senior technical and management support.

Among significant initiatives completed to date are: 1) Time of Use Data Collection-involving installation of 72 meters for High Tension (HT) consumers for load research; 2) Multi-story Building Water Pump Testing-involving tests of 5 pump sets which demonstrated substantial conservation potential (potential savings 2 MW and 1 million Kwh's); 3) Flour Mill Project-to improve power factor[2] and efficiency (potential savings of 8-9% in energy and 1000 kVA demand reduction); 4) HT Industrial Audits-conducted 22 preliminary audits and 4 detailed audits through commercial engineering firms paid for by customers (potential estimates savings of 26.4 million kWh's and 8 MW demand); and 5) Motor Survey and Demonstration Program-new domestic motors are 3-5% less efficient than imported units.

It is worthwhile to note that the effectiveness of this program component is substantially due to the close follow-up given by RMA, and the fact that U.S. experts have brought new technology to India. Other areas of the program which have received much more limited attention, and have had less enthusiastic and self-interested clients, have been significantly less productive such as the Loan Portfolio Development.

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[1] Load factor is the ratio of peak demand to the total capacity. A poor load factor indicates that peak demand is high relative to base demand. This means that the utility must have large amounts of idle capacity to meet large peak needs or, as in the case of Ahmedabad, meet peak requirements through purchases.

[2] Power factor is a measure of the quantity of power needed to get a given amount of work done.

There has not been significant attention to the constraints to consumer adoption of the above innovations thus far in the DSM program. The overall dissemination strategy of the DSM program is not well-developed at this time, although there are plans for workshops and seminars. It appears particularly important for the DSM program to give emphasis to the introduction of innovative financial incentives including: a) private and utility alternatives, and b) intensified marketing and promotion, which would be very beneficial complements to the technical efforts of the program.

It was noted that the greatest DSM opportunity identified in the DSM 5-year plan was the introduction of energy efficient residential lighting, some 80.7 of 105.5 million kWh total savings. Nonetheless, residential efficient lighting (i.e. CFL lighting) has not received priority attention in the DSM pilot for AEC. This appears to be due to a combination of lack of technical confidence in compact florescent lamps (CFL's), current use of florescent lighting, and some misunderstanding about the status of this technology. Given the extremely large benefits of lighting conservation, priority attention to resolution of these issues should yield extremely high benefits.

2. The LPD related activity has produced a large number of studies but has been ineffective in leading to bankable projects.

The LPD activity has produced a significant number of brief audit-type reports for energy intensive industrial units as well as hotels and a hospital. These reports were prepared primarily by RMA technical specialists, with basic plant data provided by Indian sub-contractors to IDBI. Studies have been completed for 20 facilities, that is, 4 each in Cement, Fertilizer, Pulp and Paper and Sponge Iron/Direct Reduced Iron; and in addition, three hotels and one hospital were surveyed. Reports have been sent to the respective plants. Twelve more studies (in three sectors: textiles, rolling mills and mini-steel mills) are planned. In addition, RMA indicates that they plan a variety of other related activities in 1996, including identification of barriers and development of strategies to remove barriers.

A review of initial audit-type surveys by RMA advisers indicate that for each case, a U.S.-based technical expert spent roughly 1 month per sector, completing about 4 industries per sector, and spending about 2 weeks on field visits in India. Commercial building/hotel reports received significantly greater RMA expert input, that is, 2 RMA experts for 1 week. In general, RMA LPD reports are very short profiles of opportunities, and contain very limited technical detail.

Financial analysis is limited to simple pay-back calculations. The reports neither emphasize next steps nor provide a specific follow-up plan. These reports would need to be redone to become "bankable" project documents. It is probable from our interviews that the majority of the identified efficiency opportunities were already known to the participating firms (e.g. cement industry).

The project’s ineffectiveness in producing bankable projects, or direct conservation actions, reinforces the view that in large industry neither further identification of efficiency opportunities nor access to funds at commercial rates, is sufficient to stimulate investment. This is consistent with the experience of energy efficiency projects throughout the world. Experience shows that major investments by senior management in industry are less a response to technical studies themselves, but are rather a response to market forces, e.g. higher energy prices, liberalization-import competition and export exigencies, and new environmental regulation, etc.

The LPD activity was not pursued in an aggressive fashion, nor was there a comprehensive strategy to attempt to facilitate efficiency investment. The current approach is "passive" to efficiency investment and can be contrasted with NPC efforts such as in the Pulp and Paper Industry [UNIDO sponsored

Demonstration in Small Industries for Reducing Waste, conducted in 1993-94: see NPC, "From Waste to Profits", 1995.] which might be termed "demand driven", that is, industry was strongly motivated by environmental regulatory pressure. The process involved close collaboration with industry associations, which helped identify and achieve specific "pilot" projects, whose experience was disseminated using pilot firms technical personnel through workshops and other means to sectoral firms.

IDBI efficiency lending in several ways is a mismatch with the scale and flexibility needed to assist small and medium sized industrial firms which appear to be those most in need of technical and financial assistance. IDBI's normal large-scale conventional lending (e.g. under ADB Industrial Energy Efficiency Project imposes special IRR and ERR limitations, conservation and energy audit requirements, procurement regulations, etc.) appear to retard such utilization. Furthermore, the usual industrial conservation project is relatively small (e.g. projects identified in AEC HT consumer audits), and relies on internal funds. This is not to say that lending through IDBI is inappropriate. However, to be effective, IDBI will need to develop complementary inputs.

3. The project's ESCO support efforts have been very effective in stimulating interest and facilitating the formation of ESCOs. But barriers do exist.

The RMA ESCO support efforts have been instrumental in stimulating interest and facilitating forming ESCO businesses on the part of a number of firms in India. These include Thermax, Tata Consultancy, Crompton Greaves, Forbes Marshall and Raju Consulting. A combination of a two-week U.S. ESCO informational visit, seminars on ESCO projects at the World Energy Engineering Conference; and 4 performance contracting seminars in Bombay, Madras, Calcutta and Delhi, were the main vehicles used.

RMA has correctly identified some of the barriers to ESCO's, that is, need for greater understanding by the financial community and ESCO's in performance contracting and ESCO risks assessment, and other barriers such as utility rates and tax laws. RMA also pointed-out the benefit of GOI granting explicit support the to the ESCO concept, and preferentially supporting the ESCO mechanism as a means to upgrade GOI facilities. It is unclear if there are specific EMCAT plans to address these issues directly.

Current ESCO efforts, oriented primarily toward shared-savings from efficiency investments, have been slow in starting. According to many persons interviewed (NPC, ASSOCHAM,..), considerable uncertainty exists with the viability of the strictly efficiency-oriented ESCO concept. In contrast to the expectations of the SRC report done for the EMCAT project, which found that both the policy environment and business conditions and practices would support conventional profit-sharing ESCO's in industry as well as commercial sectors, actual experience has been less encouraging. For example, the leading ESCO, Intesco Bhoruka's, exemplifies some of these problems. Intesco has found the ESCO business slow to develop. Profit-sharing agreements were considered essential to ESCO business, and were initially attempted, but have proven infeasible to implement (e.g. with Bombay Dyeing), causing a shift to less-complex payments out of savings achieved.

4. Evaluation findings indicate that by far the most attractive near-term market for ESCO-type services or investment appears to be providing reliable electricity supply, either stand-alone or through cogeneration, for small and medium sized industrial firms.

Such small and medium firms appeared to be those most likely to lack adequate financial and technical capability to pursue such projects on their own. A beneficial reorientation of ESCO activities appears possible, for example, reorientation to stress electricity supply has several advantages, including much simpler administrative and financial organization and the greater feasibility of being organized into a

physically and operationally separate units, as well as separable "profit-centers". Constraints also exist to this option, for example, where SEB's do not offer reasonable payments for power and/or allow wheeling. Substantial progress is being made to facilitate private power supply in India, including completion by the Central Electricity Board of a draft comprehensive policy, procedural and contract guide for cogeneration.

5. Energy Audit training is not as effective as it could be because of the basic course level.

The basic course given in India to prospective energy auditors did not provide anything in content or orientation to the 70 persons trained which was not already available from other similar courses being offered locally. For example, NPC now offers some 60-70 courses per year in energy management through its 14 field offices. Several trainee's referred to the EMCAT India-based basic course as more "conceptual" level, rather than applied. The "advanced" audit training involved firms on IDBI's approved energy auditor list, and intended to enhance skills in audit diagnostics, design of microprocessor based energy management systems, and technical and financial analysis. This latter course was a more effective vehicle for adding to knowledge already available in India, although a 3 week course, 1 in class-room, 1 in field visits and 1 at a conference, is not adequate to permit substantial upgrading of skills, nor adequate to ensure further dissemination of these skills. Likewise, the 15 trainees in the advanced course were so few as to be of minor overall significance for a country the size of India. The course was not specialized by industrial sector to our knowledge, nor by discipline (electrical, thermal, etc.), which would likely to be more beneficial given the long history of energy auditing in India. No information or training activities were supported for senior management of industry, even though senior management awareness and support is generally considered a critical factor in ensuring implementation of efficiency investment.

EMCAT recognized the need for high-quality, reliable energy audit equipment. The project provided for limited import of equipment with project funds on a cost-shared based for energy audit firms. While the need defined by RMA was for improved and more reliable basic audit equipment, Indian firms showed no interest in such equipment, preferring more advanced equipment. After revision of the list of equipment available, firms placed orders for approximately $300,000 on a cost-shared basis. In an attempt to encourage U.S. and Indian manufacturer joint ventures for energy efficiency equipment, a "Business Focus Report" was prepared to identify deficiencies in equipment available locally, and inform both the U.S. and Indian private sectors.

D. Impact

1. EMCAT DSM efforts are primarily being implemented in a pilot project with AEC, and directly have the potential for significant impact for that utility.

Additional efforts beyond AEC, particularly in such major areas as efficient lighting, municipal water and sewage pumping, and agriculture pumping, would add significantly to impact. The dissemination strategy of the project for DSM is not well-developed at this time. If such a strategy is developed and is effective, EMCAT DSM work has potential for significant beneficial impact in peak demand reduction and efficiency improvement in well-managed utilities (i.e. utilities with distribution systems well-organized and administered) throughout India.

2. LPD impact to date is uncertain, but probably very small, and is not likely to improve without significant redirection.

Redirection of industry studies to produce substantive bankable studies is likely to be one of the best ways to develop more effective initiatives to identify demand driven efficiency investment opportunities, and improve collaboration and communication with senior management of industry and industry associations, as well as utilize groups such as NPC as collaborators. Development of more directly supportive IDBI incentives and activities is also appropriate, along the lines suggested herein, but requires IDBI interest and financial support.

3. While contributing to ESCO formation and interest, there has not had much of an impact by ESCO's in energy efficiency investments.

The project has played a significant role in catalyzing interest and formation of both local and U.S.-local joint venture ESCO's. There has, however, thus far been insignificant impact by ESCO's in stimulating efficiency investments. Nonetheless, if near-term emphasis is shifted to using ESCO's to support power supply (conventional generation and cogeneration) investment, there will be greater potential for significant impact in the future for complementary efficiency investments.

4. It was not feasible to judge the impact of basic energy audit training due to the short-time since this training occurred.

Interviews with 4 participants in India-based training, however, revealed that no post-course or pre-course audits had been carried out, and a general dissatisfaction with the depth and scope of training. The EMCAT "Business Focus Report" appears to be of more assistance to audit businesses, and potentially of assistance to U.S. manufacturers in entering the Indian market. Commodity procurement of about $300,000 (originally budgeted at $1.8 million), appears to have been of some, although minor value, that is, in demonstrating U.S. equipment and adding to the stock of audit equipment in a 23 firms in India, augmenting their respective competitiveness.

E. Efficiency

The data does not exist nor has the time been sufficiently long to quantify the efficiency of the project and its components. The team is thus left to provide qualitative findings.

1. RMA's DSM efforts with Ahmedabad Electric Company have been effective and well-designed.

This has been one of the first efforts in Indian power utilities where suboptimum power utilization has been diagnosed and plans made and remedial actions carried-out. While the program has been successful, it has missed a major substantial opportunity. It has not addressed energy efficient lighting to minimize the evening peak, the highest peak of the day.

2. Efforts on LPD could have been much more cost-effective and their technical and financial depth improved. The inclusion of a much higher proportion of local consulting engineering input would have been one way to achieve this goal.

3. ESCO's offer potentially a very cost-effective vehicle for promotion of efficiency and smaller-scale power supply by USAID.

4. Neither basic nor "advanced" energy audit training provided through the RMA contract can be judged to be cost-efficient.

Use of U.S. trainers for elementary audit training in India is totally unnecessary. Similarly "advanced" audit training in the U.S. could have been much more efficient if it had been directly tied to "training trainers" and transfer of knowledge more broadly in India, rather than directed largely at a selected group of audit firms.

5. EMCAT supported training at the NPC which provided training for 6 months at a cost of about $50,000 was very cost-effective per trainee.

Deficiencies in the quality of local audits and auditors were noted by AEC as one reason for the failure of large electrical consumers to invest in efficiency measures. EMCAT attempted to address this deficiency primarily through training. Testing and certification was identified as a complementary approach which might be used to achieve this objective.

F. Sustainability

1. The DSM activity will be sustained at AEC but the possibilities for replication at other utilities in limited at this time.

DSM is potentially a very sustainable efficiency initiative, as it is in both the financial interest of the electric utility and the consumer. If the DSM activities are to have widespread replicability in India they must be adopted by a majority of utilities, the SEBs. Unfortunately, the current SEB structure is not amenable to DSM activities. They must at least be restructured into accountable units, if not privatized, so that distribution areas receive the benefits of DSM. In this way DSM can be used as an additional argument to help stimulate such structural reform.

2. As currently implemented, the LPD activity is not sustainable due to a lack of adequate EMCAT LPD prefeasibility studies and lack of effective presentation and promotion of efficiency improvement opportunities.

IDBI clearly has a serious interest in developing its energy efficiency loan portfolio to effectively utilize its credit line from ADB (US$150 million). It is reported that only US$11 million in loans have been approved and there are proposals for another US$38 million. EMCAT's LPD activities are not now significantly contributing to bankable projects for this loan. Changes suggested herein should permit LPD to both contribute significantly in stimulating investment, and become sustainable within IDBI.

3. Support for ESCO's in energy efficiency, coupled with power supply, still appears to be a sound strategy for achieving a sustainable private sector efficiency investment.

The ESCO concept has been enthusiastically adopted in India and substantial momentum has been developed by the EMCAT project in this field. Notwithstanding the problems encountered with initial ESCO strictly efficiency projects due to inherent difficulties with shared-savings, related opportunities such as power generation are a substantial market and appear to eliminate many of the problems with shared-savings arrangements.

4. The current energy auditing program is not sustainable.

Audit training activities were not effectively designed to catalyze local training efforts. The effect in stimulating local private sector audit activity is unclear, but appears to be minor. The orientation of

advanced audit support toward private sector firms engaged in audit or other efficiency work was appropriate to encourage replication.

G. Conclusions

1. EMCAT has made a good start in its program with AEC but it has missed a major opportunity.

The project has had good success in DSM. However, it has missed a major opportunity for savings by not addressing the use of DSM in reducing peak demand and conserving electricity. Each kilowatt hour of demand reduced by DSM measures cost one-third to one-half the cost of new generation and transmission which would be needed to meet that demand. Additionally, there are major environmental benefits from DSM which are not present in new generation.

2. Achieving DSM in the electrical system and consumer's end-use equipment requires innovative promotional and financial efforts, including intensified and sophisticated marketing, utility financing and repayment through monthly bills, utility and/or third-party leasing, ESCO investment, and similar measures.

3. DSM efforts will only be effectively replicated in public utilities which structure distribution operations to place financial responsibility into manageable and accountable units.

4. To date, the LPD industry study selection process, study design, and associated follow-up have not provided significant new impetus to efficiency investments.

LPD program design has been based on the faulty premise that additional technical information and potential access to additional funds was largely sufficient to stimulate conservation investment. Furthermore, LPD industry studies were not of sufficient depth to either facilitate investments within the firm (since many had already been identified by companies but not studied in depth), facilitate loans by providing "bankable" studies, nor were they part of an effective strategy for "selling" these concepts to top management. Finally, even recognizing that LPD reports are limited, follow-up of the reports has been minimal by IDBI and RMA; and other means for promoting their findings have not been defined or planned (e.g. sector workshops to stimulate investment). Since senior management sets investment priorities, LPD strategy should stress and ensure that managers understand the cost-reduction, productivity enhancement and environmental benefits of energy efficiency investment. LPD activities need to be broadened, identifying industrial priorities and constraints, and assisting IDBI to address these.

5. The ESCO component of EMCAT project has been worthwhile, however there is need to evaluate current constraints and assist the ESCO industry to "network" and understand and address these constraints.

6. It is also necessary for EMCAT to reassess the focus of ESCO support, and give more attention to market driven power supply market for ESCO's in small-medium firms. For example, ESCO's could be a very effective vehicle to facilitate efficient small power generation projects, including small-scale diesel generation with waste heat recovery, process related cogeneration and larger dedicated generation for own-use and sale.

7. Energy audit skills can beneficially be improved through training in India, and expanded efforts are worthwhile. However EMCAT activities, particularly basic audit training, while undoubtedly of general

educational value, did little to contribute directly to achieving energy savings and creating improved local efficiency analysis capability.

8. The courses appear to have only duplicated similar programs offered irregularly in India. Given the importance of senior management understanding of the benefits of efficiency investment in cost, environmental and productivity terms, priority should have been given to such training, and less attention to technical training.

9. Advanced energy audit training appears to have been useful, but quite abbreviated for accomplishing this purpose. Continuation of such advanced training is probably not cost-effective. Equipment procurement and Business Focus activities have been of limited value, and offer modest potential for sustaining introduction of better efficiency equipment to the Indian market, including U.S. involvement.

H. Host Country Contributions

Budgeted Host Contribution was as follows: US $1.0 million in technical assistance and US $0.1 in training, US $0.5 million commodities, other US $0.4 million. As per the information furnished by the IDBI, the expenditure incurred by the Host Country works out to US$0.55 million against the budgeted amount of US$2.0 million. A major part of this expenditure related to the LPD area and, as already stated, this area requires major refocussing and the balance of the HCC should be reallocated as per the revised project design as and when it is finalized.

I. Recommendations

1. The EMCAT DSM program should give greater attention to DSM options with large-scale potential for peak demand reduction or conservation such as energy efficient lighting systems. Technical and dissemination uncertainties in such areas should be addressed as priorities.

2. Due to the critical importance of innovative financing and promotional efforts in achieving DSM changes, EMCAT should give more emphasis to developing practical and effective financing and promotional schemes such as utility and third-party financing and installation.

3. EMCAT demonstrated DSM improvements should be used to help promote utility distribution reforms in other SEB's with effective management or undergo reform or restructuring.

4. In general, utility partnerships between U.S. electric utilities and Indian counterparts, should be used as way to spread sound DSM and efficiency programs. **These should be integrated with support to improve billing and collection, T&D loss reduction, power plant rehabilitation and maintenance. Note: a major ancillary benefit would be to enhance capability for utility IPP affiliates to understand Indian power market, and effectively compete.**

5. Additional LDP studies currently planned should be reoriented, redesigned and rebudgeted to strongly support the process of producing a bankable project. Sector specific industry associations, CII, NPC and industry associations, should be involved in identifying specific industrial firms as targets. Environmental regulatory requirements should be examined to determine where the greatest complementarily between EMCAT efficiency investment and environmental retrofits or investments exists. LPD studies should be adequate in scope and depth to permit both the firm and IDBI to give the proposed investments a go or no go for detailed engineering study and project financing. The reports

should be more fully documented technically, and contain financial analysis including a sample proposed financing scheme and costing.

6. LPD studies should only be performed where they are part of a clear strategy to achieve both specific projects, as well as fit into a sectoral plan to stimulate similar action. All studies should be personally presented to senior company management by RMA consultants, plus local consultants and IDBI.

7. On a sector by sector basis, workshops should be organized to share the results of LDP studies with concerned industries and any similar or resulting investments, as well as to instruct on preparation of documents adequate to receive IDBI feasibility study financing.

8. IDBI should consider establishing or spinning-off a "profit center" or venture capital entity whose goal it is to invest in energy efficiency, cogeneration and/or small-scale captive or grid-integrated independent power projects. IDBI should consider supporting cost-shared feasibility studies and creation of a revolving fund for this purpose.

9. EMCAT ESCO support should continue with limited ESCO promotion. EMCAT should facilitate interchange of information on experiences, identify market, legal and technical constraints, and assist where appropriate in addressing these. EMCAT should support a meeting of new ESCO companies to share experience to date, establish regular communication, address issues such as fiscal and financing incentives, fuel supply contract issues, IDBI venture capital participation, etc.

10. EMCAT should provide additional technical and policy support to ESCO's. This should stress electrical power supply opportunities.

11. EMCAT should work with IDBI to attempt to define innovative financing and financial incentive mechanisms to assist in promoting ESCO's, e.g. financial support to buy-down interest rate on initial ECSO projects, IDBI equity investment, etc.

12. Technical education supported by EMCAT should not be limited to engineers, but should be supplemented with complementary workshops or seminars aimed at information dissemination for senior management.

13. Energy audit support should be directed toward supporting and promoting development of improved or expanded local efficiency training. It should support trainers and training programs, and not attempt to train directly. It should also attempt to fill gaps in current technically oriented programs. For example, emphasize financial issues such as private sector capital budgeting, sources, availability and cost of funds; how to present and justify efficiency investments, place greater emphasis on financial analysis and how to effectively present reports to management and to lending institutions.

14. Support for development of a certification program for auditors would also be a desirable goal to upgrade the quality of audit work done, as well as to stimulate interest in this area as a professional development opportunity.

15. EMCAT needs to institute follow-up sample surveys of trainees and energy audit firms to evaluate and document any impacts, as well as the sustainability of training and equipment purchases.

16. The current contract with RMA should be extended until March 1999 and an additional $1 million in funding provided to expand year 3 activities and fund support a fourth year of consolidating, dissemination and replication activities.

SECTION 4: POWER SUPPLY COMPONENT

A. General Findings[3]

1. While the Indian power sector has made some impressive physical achievements in the past, the system is for the most part unable to meet power needs under business as usual conditions.

Many of the SEBs are characterized by large inefficiencies and financial insolvency in the strict sense. Unable to collect large arrears and to price power according to its costs, many of these SEBs are not able to maintain the system let alone increase it to meet the needs of a growing economy. On the one hand, they are unable to control revenues while, on the other, they also have little control over inputs and their associated costs such as fuel and personnel. This characterizes the conditions when the EMCAT project was designed and today. But there are differences between then and now:

- First, the Central Government was willing earlier to make development allocation to the States for capacity expansion. This is no longer true. Capacity expansions must come from either State or private sources.
- Second, private power is becoming an increasingly important player in India, whereas at the time of EMCAT design it was virtually nonexistent.
- Third, lenders are unwilling to provide the magnitude of funds to help SEBs meet their physical needs without some form of guarantee - either in the form of state guarantees or in the form of massive restructuring of the SEBs. Most states are often unwilling or unable to provide bankable guarantees leaving access to large amounts of capital controlled by the willingness to reform the sector; and, most important.
- Fourth, the shear magnitude of resources needed to meet the power sector's challenges are far greater today than when EMCAT was designed. This due to several factors. The SEBs and the GOI have been unable to meet the capacity requirements even before massive economic growth began. Given the significant economic growth which has taken place the gap between demand and supply has widened. Finally, the system has further depreciated requiring far more resources than were needed five years ago.

2. PFC has made some solid contributions to the Indian Power Sector. But it is unrealistic to believe that it could have become a major lender at any individual SEB for some time.

Since 1988 PFC has sanctioned loans of more than $2.3 billion and disbursed more than $1.5 billion. PFC operations cover the full range of power activities from generation to distribution. PFC's assets as of March 1995 stood at about $1.37 billion. The magnitude of the problems facing the power sector are far greater. It is estimated that in two SEBs alone external assistance will approach almost $1 billion. Even if PFC had expanded its size by six times, providing the amount of capital needed in these two SEBs would amount to almost 12% of PFC's total assets. This would indeed be a dangerous position for it to assume.

Moreover, given the financial problems of most SEBs, taking a large position in any single SEB would have been too risky. This is not unlike the conditions which existed in the oil industry in the early to mid 1980s. Many oil companies had vastly overvalued assets, were suffering large losses and could not control their revenues. No single bank could be expected or would have become a specialized lender at

[3] Appendix VII presents a detailed analysis of the current status, emerging concerns and evolving response of the power sector.

that time. To the contrary, banks were attempting to diversify away from the sector to reduce their risk. PFC cannot diversify away from the electricity sector so it must find other ways of spreading risk.

3. PFC's response to its own needs and to the changes in the Power Sector are to diversify.

The new Chairman has mapped out a plan in his "Vision 2000" which will bring PFC into a number of new areas, spread their risk by lending in new activities such as private power and increase the sources of funds. This is entirely understandable and should prove to make PFC a more viable financial institution. It will not necessarily increase its ability to be a catalyst for change at the SEBs.

B. Project Outputs

The mandate of the EMCAT project is to support the goals of USAID/India energy initiatives to improve the efficiency of both energy supply and its utilization in the industrial and other sectors. The Bechtel EMCAT Support Project (BESP) provides:

Technical Assistance (TA) : 400 Person-Weeks (PW)
U.S. Training (TR) : 1,500 PW
U.S. Study Tours : 80 PW

The EMCAT project has supported various in-country training, workshops / seminars and studies on power sector related areas in addition to the work covered under BESP. The cumulative achievements to date of TA and TR are as follows:

- BESP Technical Assistance 103.5 PW
- Training in U.S. 853 PW
- Training in India 815 PW
- In-country workshops 20
- Studies completed through Indian resources 5

Appendix VII contains a detailed list of the assistance provided in this component.

C. Relevance

1. Project Objectives and Purpose Still Relevant: Inefficiency in electricity supply has not appreciably dropped and it still remains an important constraint to economic growth.

At the time of project design thermal plant load factors (PLF) at all SEBs averaged 54.6%. As of FY94/95, this figure stood at only 55%. Both the all SEB and individual SEB PLFs indicate fairly erratic behavior over this period and do not on average exhibit any strong upward trend. For example, the all SEB PLF in each of the years from FY89/90 to FY94/95 are, in chronological order, 54.6, 50, 47.8, 54, 56.6 and 55. Transmission and distribution losses for all SEBs have fallen from 22.9% in FY 89/90 to 21.5% in FY93/94. However, the individual SEB performance is quite mixed over this period. These traditional measures of efficiency do not indicate that any sustainable gains have taken place. Perhaps a more revealing indicator is industry's perception of the government's ability to supply

electricity reliably and efficiently. One such indicator is the reliance on captive power which has grown from 8,100 MW in FY89/90 to 10,100 MW by FY93/94.[4]

2. The organizational assumptions are no longer valid.

The project design originally envisioned that PFC would be a catalyst for change by being *"a major source of both financing and, through EMCAT, technical assistance/training/studies.*" This was assumed for a number of reasons. First, the PFC had been recently established (1986) by the GOI as a development finance institution for the power sector. Second, the World Bank and ADB had committed over $500 million in capital to the PFC and would in the future channel power sector lending through the PFC. Moreover, with appropriate leveraging of its equity, PFC could mobilize even greater financial resources for the power sector. Therefore, PFC would be a major lender to the SEBs. Third, as a direct result of PFC's anticipated premier role in financing SEB power projects, it was expected that it could have a major impact on improving sustainable financial and operational performance of SEBs. Thus, it was believed that PFC would be the most effective point for USAID's relatively small dollar value assistance.

PFC's position as a major source of power sector financing has failed to materialize. The World Bank and ADB have by-passed PFC and are now in the early stages of lending directly to several SEBs. Moreover, the OFAP conditionality for lending has proved to be a major constraint to funds mobilization.

2.a. Drastic changes are required to bring about appreciable and sustainable efficiency increases and the SEBs undertaking these changes do so because they have no other choice.

In a recent Aide Memoire the World Bank has concluded, "the project objective set before PFC of improving SEB performance through conditional lending is not achievable unless more basic reform measures on tariffs, independent regulation and privatization of distribution are adopted by the States for their power sector." This is due to several reasons. First, PFC's loan conditionalities help to strengthen performance at strong SEBs but do nothing to assist weak SEBs with necessary changes. Strong SEBs are those able to get sufficient state subsidies not necessarily those making important operational and managerial changes or in states undertaking important tariff reform. Second, those SEBs undertaking the major reforms have stated that they do so for two reasons: They are able to carry out the reforms because of large financial assistance from the World Bank and ADB; and, they have exhausted other possibilities and no other choice now remains. Third, reform requires large amounts of capital. As a DFI, PFC cannot afford to take the loan position required to bring about restructuring at the SEB level. To do this, it would incur too much risk. It is another matter for the World Bank or ADB to put $500 million in a few SEBs. They have a larger and more diversified portfolio.

3. Planned Activities Still Relevant: Substantial changes have taken place in the power sector such as private power and restructuring at the SEB level. These changes have not obviated the planned technical assistance and training.

EMCAT was structured to provide TA and training on a wide range of subjects to the PFC and SEB's which qualified through the OFAP process to participate. With very few exceptions the skills needed to be an efficient SEB are no different than the skills required for an SEB to bring about the restructuring process. For example, tariff reform was an important part of the OFAP process even before

[4] Data for this section is from the Centre for Monitoring Indian Economy, July 1995.

"reformation". It continues to be an important aspect. To be sure, additional areas of TA and TR could be useful to reform minded SEBs in the areas of regulation and human resource development.

4. Course topics are relevant but sometimes course content is not relevant for both PFC and SEB.

PFC and the SEBs have fundamental different roles and therefore, very different institutional development needs. For example, project appraisal training should emphasize some of the same areas for both PFC and the SEBs. But PFC must learn to see projects from the point of view of a banker and SEBs from the point of view of the purchaser. This does not mean that there cannot be some common elements in a course but rather it means that there must also be separate attention paid to the specific requirements of each participant group. This has not been done. For example, BESP's TR#3, TR#6, TR#7, and TR#10 (Appendix VII) are totally irrelevant for PFC's institutional development needs. However, some of these could have been designed for PFC to illustrate the typical investment requirements for T&D loss reduction and/or T&D upgrade projects and procedures to develop a bankable project for lending.

5. The IPPD project covers a number of areas which are in concert with BESP activities.

The IPPD is developing a number of products which are of great interest to all SEBs, one of the supply side clients. In fact, BESP has focused primary on activities downstream of the busbar[5] while IPPD have focused so far on generation activities. Together they support the full range of utility activities.

D. Effectiveness

The goal of the EMCAT supply side component is to improve the efficiency of energy supply and to support private power development. Given the amount and type of assistance delivered and the broad based nature of project assistance, it is difficult to expect or quantify progress in the short run. Instead the team measured the success in meeting planned activities and project outputs.

1. Very little TA has taken place in the first half of the project, rather the focus has been on training.

The project is to deliver 400 person weeks (PW) of technical assistance in such areas as development of manuals, policy studies and pre-feasibility studies. To date a little more than 100 PW of activities classified as TA have been delivered. Activities better classified as training of 43.5 PW were included in this total. Technical assistance in the support of training activities will be discussed under training. The other 60 PW of TA were focused on preparing frameworks for the OFAP, Project Appraisal and Investment Manuals, a review of the PFC organization study, and the improvement of PFC's library. Many of the benefits of these exercises are long term in nature and are not, therefore, measurable at this time. However, based upon the time remaining and the annual work plans, it is safe to say that the project is behind schedule in providing much needed TA.

2. Without a Training Needs Assessment, Training will not be as effective as it should be.

Training courses were designed and implemented without the required training needs assessment, as per the contract, and it is no wonder that participants often claim that courses were too general in nature.

[5] EMCAT has undertaken a major R&M project through the US DOE but the focus of TA and Training under the Bechtel contract has been on transmission and distribution.

Project design called for the PFC and SEB's to conduct the assessment with the assistance of the contractor, which was a major mistake.

3. Courses were less effective than they could be because the Contractor placed the onus of determining course requirements on PFC and the SEBs.

Quality and content of some training programs were designed for general engineering professional development rather than the institutional needs of PFC and SEBs. For example, course materials of TR#9 indicate that it is a general introductory course for the power system planning process rather than "Techniques of Financial and Economic Appraisal and Monitoring of Power Projects".

The Contractor, instead of working with the PFC and SEBs, depended on the PFC and SEBs to take initiatives to develop the training course content. The Contractor's memorandum dated May 31, 1994 noted (more than one year after the EMCAT project started) that "writeups of several pages each are required from the PFC on all TR's expanding on PFC and SEB needs and requested course content, at the very latest three months before each course is scheduled to begin. . . . . At present, for many of the TR's , all that has been provided by the PFC are one sentence course titles". We find that above statements are consistent with the inappropriate training course contents and the need for new approach for designing training and study tour programs.

4. Overall there has been a lack of long range planning and poor management and coordination of assistance.

Bechtel has failed to carry out several of the critical planning functions as set forth in their contract. For example:

- Assist PFC to develop detailed EMCAT implementation, work and monitoring plans and collation of baseline data to monitor EMCAT Progress[6] *-*

No such detailed plans exist and the 18 month workplans (Section F.6 of the contract) which would have formed the basis of the contractor's assistance in this project do not appear to have been prepared. No such report was available with the contractor, USAID or PFC. Instead the contractor developed annual action plans covering only one year's activities.

- Develop all required Scopes of Work (SOW). After the SOW have been approved by PFC, the Contractor shall propose at least two consultants for each consultant required.

For several key TAs, the approved TORs are different from the what has been delivered. Review of the files at USAID and the Contractor's office produced a set of TORs on which approval to mobilize the teams was given. The draft manuals differ from these TORs and comments from PFC further indicated that they expected more detailed information than what was provided. Many months after the first drafts were submitted Bechtel's summary report of Tas one through three contained a new set of TORs which were different from the original TORs. The new set of TORs cannot be documented as having been approved by PFC or USAID. Also, the contractor does not propose at least two consultants for each task as required and this is a major source of irritation with PFC.

The italicized sentences are from the Bechtel contract.

- Training - First Priority: assist PFC and the SEBs with an in depth training needs assessment building on any assessment already completed or in progress...Training Coordination Role...First Priority: assist in reviewing portions of training needs assessments already completed by PFC and the SEBs; provide assistance in conducting additional training needs assessment in each EMCAT activity area as required. This will require an early visit to India lasting at least several weeks.

The contractor's training coordinator visited India in May 1993 but it was not until six months later and after work had already begun on training courses that the contractor undertook a Training Planning and Implementation study. This study was an outline of a training needs assessment and training plan.[7] The section of the report covering the needs assessment was barely one page with no detail to assist PFC or the SEBs. No other assistance has been provided to PFC or the SEBs in training needs assessment. For the training needs assessment flows the training plan and this provide invaluable information to course developers. Without such information it is simply hit or miss to target the level of difficulty and course content to the participants needs. To date no training needs assessment has been carried out and over 50% of the training as taken place.

It should also be noted that the person delegated to perform the above referenced work did not meet the contract requirements. He had little previous experience in "organizing training for electric utility professional staff and management."[8]

- Coordinate India and US course content to ensure congruity and continuity

This has not taken place either due to the absence of a training plan based on training needs assessment or to concrete interaction between the contractor and PFC.

5. PFC's role in the approval of BESP project activities has impeded both the type and amount of assistance.

The contractor's annual workplans attempted to link technical assistance and training and to do so in key areas where PFC and the SEBs require assistance such as strengthening skills in development finance and restructuring/privatization. According to contractor documents the work plan was developed in close coordination with PFC and many of the Tas and TRs were originally approved. Yet, PFC later rejected Tas and Trs in areas important to its own institutional development. TR1 was to have been training on investment planning to meet the critical needs of PFC. It was originally approved by PFC but once designed it was rejected as it was exclusively for PFC.[9] TA#7 was designed to provide a seminar in investment planning and was approved by the Chairman on 2/23/94. It was never implemented.

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[6] *E. Lam reported on 9/8/93 that "After some discussions, a remedial action was decided on. It was agreed that Bechtel should present the resume of a candidate training coordinator when this candidate is found acceptable by PFC and USAID, he or she will conduct a 4-6 week TDY ....to perform training needs assessment and design the training program." On 11/3/94 Bechtel received country clearance to "3. Develop a TR master program for the four years and a detailed plan for the TR activities sanctioned by PFC for the first year. The master plan will include training methodology, needs assessment, criteria and procedure for selecting trainees, and prioritizing topics for training."*

[7] *Source: Page 26 of the Bechtel Contract.*

[8] *Source: BESP Quarterly Report, January 14, 1994.*

For lack of any other analogy the process has been much like a patient telling the doctor what his illness is and how to treat it, rather than describing his symptoms and seeking the doctor's guidance.[10] The result has been the exclusion of important TA and TR in policy areas or in banking related activities. For PFC to become an effective DFI, it requires technical assistance and training in areas such as risk management, accessing capital markets, funds management and a wide variety of other banking related areas. PFC has not seen the need in the past to use the project as a vehicle for gaining these skills. It does point to in-country courses it selected in this area. However, a review of these course indicates that they were not chosen to meet critical banking needs.

PFC has been slow to comment on work products. The long delays between delivery of a product and PFC's comments means that: (1) the final product is not available for use for long periods and (2) by the time comments are received, the concerned consultants may no longer be available for quick response. For example, Tas 2-3 were delivered in December 1993 but PFC's full comments were not until May 22, 1994. For other TA products the turnaround time is running between one and one-half to two months.

6. BESP and IPPD while working out of the same office, have not intentionally coordinated their TA and TR activities.

BESP and IPPD assistance can be more effective if they coordinate activities to enhance products and avoid duplication. For example, they both had planned activities in privatization, utility restructuring and database development. It is conceivable that, without coordination, their outputs may have some duplication.

E. Impact

1. Judged by the log frame impact indicators (related to "Project Purpose") the project has not made significant headway from FY92/93 to present.

- T&D losses were 21.8% (FY92/93) vs 21.5% (FY93/94).
- Thermal PLFs have increased from 54% (FY 92/93) to 55% (FY94/95).
- Captive generation is increasing, albeit at a slower rate.
- Cogeneration is virtually nonexistent.

It is difficult to determine to what extent the project had contributed to these changes, if at all. Thorough examination of the data fail to identify that trends had been established. However, it should be noted that the assistance has been in a wide variety of areas which may only remotely contribute to the movement of these indicators. Given the very nature of the assistance provided and the problems which it is attempting to solve, these long run indicators will not provide useful information about the project's success in the short run.

2. The impact of Bechtel's TA is mixed. In the area of Power Sector Investment Planning there are two factors which have limited the effectiveness of TA in this area: the reluctance of PFC to approve TA and the time it has taken to complete the approved TA.

The problem of PFC's rejection of TA has been discussed above. It impacts both the quantity and the quality of TA. This section will address the contractor's role in carrying out the TA.

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[9] *The contractor's practice of relying on the PFC to determine the course requirements and contents suffers from the same problem.*

2.a. The "Manuals" are of reasonable quality but sometimes fail to focus on key problems identified in the findings and issues of the summary report.

For example, the summary report finds that there is "insufficient emphasis on financial appraisal...and appraisal report does not contain adequate analysis of the ability of the borrower to repay the loan or of the project to generate sufficient cashflows to service the debt of a project". These are important observations which are not explicitly addressed in what is to be a framework for experts to develop a manual. There is no mention of the technical analysis/evaluation. Does this indicate that it should not be part of the Appraisal manual? Other important omissions include the lack of discussion on the least cost plans and their relation to the evaluation and approval process.

On the TA side, BESP project assistance has focused primarily on three manuals. The OFAP manual was finalized in late 1994 and the project appraisal and investment manuals have still not received final approval from PFC. Thus it is unlikely that they have had any measurable impact. Two other TA products are the PFC Library Development and the Review of the PFC Organization study. The benefits of the PFC library cannot be measured in the short term.

2.b. While there are quality problems with the Manuals, the perception of their failure is greater than it is in reality.

There is a general impression by USAID and PFC that this TA failed to achieve its TORs and is of generally poor quality. This is more a problem of presentation and planning than of substance. The process of planning, presenting and managing the TA for manuals is extremely confusing. This confusion is further compounded by discrepancies between the documented TORs and the final TORs used by the contractor. From the start these products are inappropriately labeled as manuals. The TORs describe them to be frameworks or outlines. Another generic problem is that these outlines are divorced from the findings, conclusions and recommendations of the TA team. **These findings, conclusions and recommendations are in general good but appear only in the summary manual.** They should appear in each framework so that future consultants finishing the manuals will have a more thorough understanding of the PFC's needs.

The team examined the Project Appraisal and Investment Manuals and their transmittal letters in detail. The problems of determining the official TORs was discussed above. Regardless of which set of TORs is used, some confusion remains. The contractor's file did not contain the drafts submitted in early December to PFC and in each manual no mention is made of the TOR. It would thus appear that this is a final product and no further work is required by the contractor. It clearly states on page 5 of the Project Appraisal Manual, "It is the responsibility of the Director of the Projects Division to keep the contents of this manual up-to-date". No further mention is made of the work which remains to be completed before this is a fully developed manual.

The second year annual work plan includes TA to complete the manuals but no mention of this appears in the manuals themselves. In July of 1994, Bechtel submitted a summary report on the three manuals. Herein are contained the revised TORs. Appendix One presents the recommended next steps in the Development of the Manuals. It suggests that Tas be prepared for completion of the Appraisal Manual and that consultants complete the manual. This is not linked to TA 17 of the second annual work plan. In fact it identifies 9 steps to completion and yet none of these appears in the BESP annual work plans. This appendix also indicates that the Investment manual requires further work to be carried out by consultants. Since the required consultants are not linked to work plans or identified as Bechtel

consultants, the impression could be that Bechtel feels it has discharged its responsibilities. This is in conflict with either set of TORs.

A similar disconnect arises with regard to the TORs requirement of the training needs assessment in each of these areas. It appears in a later summary report but no mention is made in the manual.

3. The remaining Bechtel TA has been in information dissemination and policy dialogue. BESP has carried out a major TA in support of this effort at PFC.

BESP has provided TA designed to assist PFC in improving their library. This TA has made a great impact on acquisition of materials, structure of the data and making information available to users. In all, this has been well designed and implemented.

4. The impact of US Training has been more to acquaint participants with concepts or a new way of looking at a problem than it has been to transfer skills.

As a needs assessment was not carried out, the courses tended to be very general in nature, often covering subject material which the participants were already well acquainted. However, one major benefit of the US training has been to show participants that more efficient alternative systems and methods exist. Looking at the same problem in a new way, even in very general terms, can be a major catalyst for reform and innovation. Transfer of skills would have been more effectively carried out in country and would, therefore, have had a greater impact by reaching more people or the same number of people for longer periods, assuming a proper needs assessment.

F. Efficiency

1. Project activities are not as efficient as they could be.

Currently TA consultants leave the country before preparing a draft final report. In the past this has resulted in significant delays in finalizing the product. Moreover, it has taken much more of the resource coordinator's time to finish the products and/or interface with PFC than would be necessary if the consultants had a face-to-face debriefing with the client and address their comments before leaving.

As mentioned above, US based training has too often covered topics which are just as easily taught in India. They have provided little or very little input which is unique to the US experience. It is more cost effective to send one or more trainers to India to teach the course and train trainers, than it is to send a small number of participants to the US.

2. The resource coordinator functioned as an office manager rather than a coordinator of resources.

The previous position of resource coordinator operated not in coordinating resources but more as an office manager according to results of PFC and Bechtel interviews. Workplans which should have been developed by the resource coordinator were allowed to be developed primarily by another individual. This resulted in additional costs to the project and the preparation of planning documents by an inappropriate person. The evidence indicates that this position acted more as purely logistical support with a bare minimum of interface with the client. A local person performing these duties would have been appropriate and far more cost effective.

G. Sustainability

1. As the project was designed, no provision was made for sustainability or replicability.

The EMCAT training program has provided training and workshops in a variety of power sector disciplines in U.S. and in India. There are several training courses on energy efficiency improvement, most focusing on increasing T&D and power supply efficiencies, and with little or no emphasis on institutional development needs of PFC and SEBs. None of the training courses cover the specific institutional needs in the areas of designing a bankable project and/or procurement rules and guidelines for the multilateral banks. No provision has been provided for the follow-up training for selected former trainees or plan for in-country refresher courses one or two years after completion of US. training program. Dissemination of training information needs to become an integral part of the training process.

Training courses and study tour programs did not have an information dissemination activity. For example, returning trainees could have organized seminars/workshops on the same training topic and used the training materials in their respective institutions for information dissemination and institutionalization of the training program. Another major shortcoming noted by team was the lack of institutionalization of the TA and training courses. All training courses could have been designed with class notes, hand-outs, and procedures for specific problem solutions under the Indian environment, so that the participants upon returning to India could undertake a variety of information dissemination activities including teaching similar training courses in their respective SEBs.

H. Host Country Contribution

The Host Country Contribution (HCC) of this component is budgeted for US$5.3 million. Disbursements as of 12/31/95 totalled to US$1.87 million(35%), the majority of which is related to the Training component. HCC is on schedule.

I. Conclusions

1. PFC will not, for the foreseeable future, be a major source of financing in the overall power sector and cannot be expected to be the catalyst for major reforms which are necessary in the power sector.

2. If PFC is to achieve important gains within its constraints, it must change its role. Otherwise, it will dilute its assets in a variety of areas without contributing to the important changes which must and inevitably will take place. It can increase its ability to assist in bringing about change by targeting reforming SEBs for special assistance, particularly in renovation and modernization. It can also participate in loan syndication with the World Bank, ADB and commercial banks.

3. Since PFC has been unable to assume the role which was envisioned for it in project design, USAID's assistance to PFC cannot be expected to have the same magnitude of importance or to contribute to the project's objectives at the same speed.

4. Much of the assistance that is given to PFC will show measurable impact on the project's performance measures only remotely and only in the long run. However, the team has determined three areas where EMCAT can and, perhaps, should work alongside PFC - R&M, policy studies and information dissemination. Additionally, assistance should be provided in banking functions such as risk management, investment planning, capital markets access and foreign exchange markets.

5. USAID can either concentrate on supporting PFC or concentrate on supporting much needed technical assistance in the SEBs. Resources are not available to do both.

6. USAID's BESP related assistance has not shown much of an impact for a variety of reasons principal among which are: a) it is spread over too many topical areas; b) it has not focused on providing the priority assistance which is needed at a specific point in PFC and the SEBs development; and c) management by the contractor, PFC and USAID did not provide sufficient quality control and only partially met the SEB/PFC needs.

7. If USAID is to achieve quantifiable gains with its relatively small assistance, it must leverage and focus its assistance.

8. If EMCAT and IPPD activities are carried out in close coordination and treated for planning and management purposes as one project, they will support one another and the impact of their combined effort will be greater than that of their separate efforts, particularly as they focus at the reforming SEB level.

9. Given the changes in the energy sector since project design, the original activities are all relevant but some additional activities are now important to SEBs such as TA in privatization, restructuring and regulation.

10. US based training which does not impart something unique to the US experience is not cost effective.

11. Tas begun in India but finalized abroad are not cost effective.

12. The sector's problems are more financial, managerial, and political than they are engineering/technical.

13. The project has suffered because the resource coordinator's title was taken too literally. There was no proactive role in anticipating the clients needs or active involvement resolving them. There was very little technical component to the coordinator's performance.

14. There has been a lack of clear and effective communication among all parties resulting in the contractor delivering work that later PFC believes is inappropriate to the TORs and in delays in the PFC responding to these products.

15. The log frame objective and purpose level performance measures are long run in nature and to judge performance in the short run other indicators are required.

16. For technical assistance to have much of an immediate impact, it needs to be available in a timely manner. One bottleneck to quick delivery of the final product is the PFC review process.

17. If the new resident advisor's position is to provide the support and do so effectively, the advisor will need to be more involved in the day-to-day delivery of assistance and in communicating with PFC and the SEBs.

18. **Lastly and most important: the failure to plan is a plan for failure.**

J. Recommendations:

The team's investigation indicated that the assistance being provided was too ambitious in scope and the funds too few to bring about measurable change in the sector. The needs of the sector are real and concrete and this offers the project an opportunity to focus on a few key or pivotal areas of assistance. There has been widespread agreement that the project should focus on a few areas at a few SEBs and PFC. Our investigation also indicated that the manner in which the assistance was provided proved to be a bottleneck to assistance and future project implementation must consider service delivery. The recommendations for improving the project appear below. These recommendations are based upon the team's work in India and our collective experience in energy projects around the world.

Meetings where held with PFC and seven SEBs to determine their priority needs. These views are reflected in the recommendations.

Area # 1: Management and Planning Activities

1. EMCAT project planning, budgeting and implementation needs to be improved. A work plan covering the life of the project should be prepared and used for planning purposes. Annual work plans will be prepared keeping in mind the comprehensive work plan. This comprehensive work plan is a moving target and needs to kept up to date as and when tasks are completed or rescheduled. Implementation requires closer involvement between the contractor and the client in preparing Control Work Plans and in service delivery.

2. The contractor should be required to develop the new comprehensive work plan, training needs assessment and training plan.

3. There should be biweekly meetings between the Contractor and USAID and the Contractor and the Client to review the status of ongoing and planned activities.

4. PFC should consider changing the review relationships. It is recommended that PFC consider the following model. The Chairman, in consultation with the directors, determines the proportion of EMCAT assistance going to each of the three PFC divisions - Finance, Projects and Institutional Development. Within these bounds the contractor works with each Director to determine his requirements, finalize work plans and submits the final product.

5. Following the suggestion of USAID and the agreement of the Chairman, PFC, an EMCAT Advisory Board should be formed. The purpose of this advisory board is to assist in implementation of the evaluation recommendations, focus the project and direct future activities.

Area # 2: Client Relationships

1. To increase the speed of service delivery and to assure that it meets the needs of end-users, the project should change its reporting relationships. PFC's vision 2000 will place PFC on the path of a full service DFI and the team realizes the benefits of treating PFC more as a partner, as are other DFIs, in this process than a client. This also necessitates a change in relationship. This change has already taken place as the team worked with the World Bank, ADB and the PFC in establishing the priority needs of the SEBs.

a. For assistance provided to PFC for institutional strengthening, PFC is the client and the contractor should naturally work with PFC in developing work plans and tasks. The contractor should finalize these plans in consultation with PFC.

b. For assistance provided to SEBs, the individual SEBs are the clients. It is anticipated that much of the work will be developed for or at a single SEB but made available to any other interested SEBs. Therefore, the contractor should work directly with the SEBs in developing associated work plans and tasks and they, the SEBs, should approve these. For example, work in preparing staff for restructuring will be developed and implemented at a single SEB. It can later be replicated at or by other SEBs. It is also envisioned that many of these activities will support PFC's vision 2000. For example, the extension of Renovation and Modernization TA will provide opportunities for PFC loan appraisers to work alongside consultants and the SEBS and to develop bankable projects as a result.

c. The categories and priority of assistance were developed for a group of reform minded SEBs. This is not to infer that nonreforming SEBs would be excluded from training or the benefits of technical assistance. Rather, the areas chosen for TA recognize the immediate needs of reforming SEBs and would be implemented in those SEBs. In all but a few cases, this TA and training is of use to all SEBs. Nonreforming SEBs would have access to training on a space available basis and later through Administrative Staff College of India (ASCI) courses. These SEBs would benefit from TA products which after completion would be placed in the PFC library.

2. EMCAT should work in close concert with the PFC, World Bank and the ADB in supporting and reinforcing positive movements in the power sector. It is imperative that efforts not be duplicated or be counterproductive. Therefore it is recommended that EMCAT assistance take place in support of World Bank and ADB initiatives in SEB reforms.

Area # 3: Funding and Contract Extension

1. It is recommended that the Bechtel Contract be extended to the December 31, 1999. However, direct support by the Resident Advisor would be phased out by the end of 1998. Activities in the final year of the project would consist of training provided through ASCI to the SEBs and replication of TAs by local consultants. The activities covered under the IPPD component should likewise be extended to December 31, 1999.

2. It is recommended that USAID obligate the remaining funds for this component.

3. At this time additional funding can not be recommended since the impact of restricting US visits and converting the training coordinator's position to a local hire and the more active involvement of resident advisors in providing technical assistance cannot yet be assessed. It is, therefore, recommended that the contractor derive a new budget to reflect the changes agreed upon by the GOI and USAID. The evaluation team supports the injection of funds, as required, to extend the project.

Area # 4: Training and Technical Assistance

General

1. The Technical Assistance and Training should become sustainable and replicable by bringing an important training institute such as ASCI into the process. They will be able to work alongside project trainers and later provide the material out of their institute. Also assistance would be given to PFC to increase their library's ability to collect and disseminate the EMCAT deliverables to outside parties.

2. US visits should be limited to only those activities which are unique to the US experience and which cannot be presented well in India. Participation in the regulatory process is an example of training appropriate for the US. Cost accounting is an example of a course better taught in India. **In effect, this means that no US training is recommended.** Study tours to the US and other countries are recommended as appropriate.

3. **There is no longer any need for a US based training coordinator.** Since the emphasis will be on local training, a local training coordinator should be hired to work under the direction of the Resident Advisor and in close coordination with ASCI and the client. Assistance in arranging and facilitating study tours will be provided on an as needed basis in each study tour Control Work Plan.

4. Prior to any training provided by the project, the contractor should develop a training needs assessment with assistance of the final clients.

5. The contractor should develop the course outlines based on discussions with the client rather than asking the client to develop the course outlines.

Specific:

PFC

1) Banking Oriented TA and TR - It was observed by the team early in the process that PFC had failed to develop sufficient skills in banking functions. This observation was further confirmed by the Chairman and by subsequent interviews with PFC staff. Immediate needs include the areas of accessing capital markets, standardizing loan applications and loan review process, financial engineering, risk analysis, and more attention to analysis of projects from a bankers point of view rather than one of engineering.

Since this area is agreed upon by all, it is recommended that assistance can be immediately provided in developing a standard loan application and loan application process and completing the project appraisal manual along with on-the-job training in appraisal with special emphasis given to the role of credit analysis. This is not intended to provide project appraisal skills for the SEBs. This work should be coordinated with the Director, Projects, PFC. The remaining areas can be addressed when the workplan is developed in coordination with the Director, Finance, PFC.

2) Policy Studies - There are a number of policy issues which are better decided on a national level rather than state by state. This is due to two factors: the need to avoid duplication of effort and the fact that some of these issues involve interstate transactions. Issues which need to be addressed include: 1) bulk tariffs; 2) lifeline rates; 3) interstate transport of power; 4) role of renewables and nonconventional energy; 5) review of National policies which impede energy efficiency; and 6) environmental and social issues in power production. The contractor should work with the Director, IDA, to determine the appropriate needs and develop the work plan.

3) Information Dissemination - PFC's own vision 2000 and the team's meetings with SEB confirms a need to concentrate on the collection of information and dissemination. SEBs are entering into a number of studies which have potential benefits for other SEBs. The problem is not one of adapting a study from one particular SEB to another. The problem is more basic; one SEB does not know what the other SEB is doing. It is recommended that the project undertake a quarterly newsletter as a forum to announce

studies and topics of concern to all SEBs. This should be housed at PFC as central custodian of this information.

SEBs

Based on meetings with seven SEBs, the team determined that the following areas of major concern and should be addressed by EMCAT. Our meetings were not of sufficient length to determine the precise needs in each topical area. However, this process has narrowed the focus and it is recommended that the resident advisors continue this process in meetings with the individual SEBs, something the SEBs requested in our meeting.

1) Human Resources Development - All the SEBs interviewed expressed this as a major area of concern and one in which they have no outside assistance. Areas recommended are to assist targeted SEBs to develop organizational structure, define jobs, competency profiles, and establishment of work norms or productivity/performance measures. EMCAT could develop and assist in implementation of the interim systems and procedures, such as recruitment, grading and remuneration necessary to allow transfer from SEB to other State government enterprises. Additionally, EMCAT could develop, in conjunction with the chief executives and his team, the human resources strategies, policy, procedures and practices needed to support the corporate goals of corporatized SEB enterprises.

2) Regulatory Issues: The establishment of an independent regulatory body is a precursor to effective restructuring. In fact, one SEB not considering privatization had, nonetheless, expressed an interest in a regulatory body. The team determined two areas where assistance is important. First, there is a need to "sell" the concept to senior policy makers. This could be established with a series of white papers and high level seminars. Second, assist reforming SEBs in establishing regulatory functions and develop a regulatory processing plan for these functions within the context of current regulatory reform in India and legislative mandates. Furthermore, for all other functions which are periodic in nature, recommend regulatory processing time limits and service level goals.

Provide appropriate training programs for the Regulatory Agencies in the areas of utility rate design and financial analyses.

Develop staff capabilities of Regulatory Agencies to monitor and to evaluate the technical, economic, and financial implications of private power projects and privatized distribution utilities.

Develop training programs for the Regulatory Agencies in the following areas:

- Seminar on regulation of public and private utilities;
- Seminar on rate design, revenue allocations to customer classes;
- Project economic appraisal; and
- Other training program as needed.
- Communication training for both internal and external purposes.

3) Customer Relations - This is a relatively new concept in public services and in which all SEBs expressed an interest in obtaining assistance. Areas of concern were fault repair systems, information technology, and rural interface mechanisms.

4) Unions - SEBs recognize that they are not skilled in dealing with unions in general and employee relations. They have requested that EMCAT provide assistance in this area including collective bargaining.

5) Load Dispatch - SEBs expressed a need to have assistance in this area particular in communication procedures and technology.

6) Competitive bidding support - The Center has recently amended its policy to allow for projects up to 400 crore to be undertaken by the SEBs without requiring CEA clearance. In addition, the Centre has given hint to the possibility of issuing a bulk rate tariff policy designed to simplify the competitive bidding approach (although not until after elections). Regardless, electricity boards will need to develop a robust bidding process that ensures qualified offers are elicited at acceptable tariff. Development of such a methodology at a national level (currently being undertaken by IPPD) will provide general principles and guidelines that can be used by electricity boards. Additionally focusing this effort towards an individual SEB(s) would provide greater leverage and demonstrable success of USAID support in the private power sector.

Several needs have been identified: direct TA to an SEB in implementing the guideline principles to an actual bid program that could be undertaken on a demonstration basis.

The opportunity exists to make substantive contribution in a state by supporting the development of a new facility (or suite of facilities) in a streamlined, replicable manner. It would complement the activities of the World Bank and ADB as their assistance efforts are now focused at the state level. This success could be reinforced by attracting other funding support (e.g., World Bank, PFC, ADB) for a similar activity in one or more other states committed to reform and in need of such assistance.

7) Bulk Rate Tariff - The formulation of a sound bulk rate tariff policy (ala Pakistan or California model) could accelerate the introduction of new capacity by the private power sector by shortening the current MOU/Competitive bid PPA negotiation process and increasing the flexibility of the private sector to respond to specific needs of the SEBs and Central power sector

TA should be intensively focused on key Centre agencies including and MOP and DEA. If successfully developed, TA should then be provided to a selected SEB to implement and carry out a solicitation for bulk power purchases.

Assistance provided at the SEB level will be necessary in order to ensure rapid, effective implementation of the policy. Such TA activity at an SEB level would be integrated with the least cost planning activity (No.5 outlined below) to determine local tariff features such as type of resource required and the appropriate pricing..

8) R&M Support and Privatized Generation - The capacity shortage throughout India is intensifying daily with shortfalls of nearly 20 percent in peaking capacity and 10 percent energy. Indicative of this situation is that fact that there have been at least 5 total grid collapses this several months. The need for new capacity is presently projected at nearly 1,000 MW per month over the next 5-6 years. Private sector initiatives underway are not expected to yield significant results until the 1999 or 2000, at which time the power shortage is expected to exceed 40% nationwide. Finally, new initiatives via the competitive bidding route will not realistically yield results until the year 2000 or thereafter.

K. Interim Steps

Implementing the recommendations will require significant effort and resources to develop implementation plans, to make available finance, manage the implementation process, monitor progress, coordinate all training programs, and approve final actions. USAID/India must be aware of the need for action to take advantage of the opportunities identified. The direction and the extent of re-programming of the EMCAT must be determined based on the budgetary constraints of the project. The process of reaching agreement on the points of the evaluation is time consuming and there are some activities which all parties will agree need to be completed regardless of the outcome of this process. It is recommended that those activities commence immediately. The activities recommended for funding prior to this agreement are:

a) Standardization of the PFC loan applications and loan application process.
b) Completion of the Hydro PPA.
c) Scoping paper and background research on the bulk tariff.
d) Completion of the project appraisal manual along with on-the-job training in appraisal with special emphasis given to the role of credit analysis.
e) The Resident Advisor should begin the process of meeting with the SEBs to further refine the work needed in the above referenced areas.

SECTION 5: GENERAL PROJECT RECOMMENDATIONS

1. Project Assistance Completion Date

It is recommended that the project be extended to December 31, 1999.

2. Manage EMCAT Components as if they are activities under one project rather than separate contracts.

The four separate contracts have much in common and will contribute to the SEBs in four distinct areas, including the renewable energy contract. But it is important that they have a unified approach. This will avoid duplication and lead to measures which reinforce each other's activities. To assist in this unification, USAID needs to integrate its management of contracts and ensure that contracts are both coordinated and directed in a consistent and mutually supportive manner:

3. There is a need for strengthening USAID's supervision and support EMCAT project activities, particularly in the area of reviewing the Contractors performance of services under respective contracts and project goals and objectives.

4. It is recommended that the remaining funds for the IDBI and PFC components be obligated.

5. More effort must be given to dissemination of project activities. The project could establish a quarterly newsletter which is circulated to the power sector. The newsletter could cover a wide variety topics and be used to acquaint readers with project activities and any other relevant activities of the SEBs, industry participants and interest institutions.

6. A representative of ASCI should become a member of the Project Review Committees.

APPENDIX 1 EVALUATION STATEMENT OF WORK

ATTACHMENT 'A'

DELIVERY ORDER STATEMENT OF WORK

BACKGROUND

A. GENERAL

USAID/India is evaluating the bilateral Energy Management Consultation and Training (EMCAT) Project, now in its fourth year of operation, since it was authorized on April 26, 1991. Subsequently, the Project Agreement was signed between Government of India (GOI) represented by the Department of Economic Affairs (DEA) in the Ministry of Finance, USAID/India, Industrial Development Bank of India (IDBI) and Power Finance Corporation Ltd. (PFC), the implementing agencies for EMCAT in June 1991. The current Project Assistance Completion Date (PACD) of EMCAT is 03/31/1997.

To provide technical assistance support for private power development (policy for private power announced by GOI in 1992) and reform of the power sector, a separate activity for private power development support was included under the PFC component of the project in 1994. The EMCAT project was further amended in 1995 to include support for policy development for commercialization of renewable energy technologies. This activity was included under the IDBI component of the project.

The goal of the EMCAT project is to improve the efficiency of both energy supply and its utilization in the industrial and other sectors. The purpose of EMCAT is to improve India's technological and management capabilities for the supply of energy and for the efficiency of its end-use by private industry and other sectors. Specific improvements are expected to include: reduction in transmission and distribution losses; increased power generation capacity through State Electricity Boards (SEBs) purchase of power flowing from co-generation; increased use of energy efficient technologies in selected energy intensive industries and increased involvement of industry and business associations in promoting energy conservation and policy reforms. The Logical Framework Matrix which has been adopted for the project is provided in Annexure 1.

The EMCAT project has two main components : an energy supply component aimed at improvement in the efficiency of energy supply, including transmission and distribution and an energy efficiency/demand side management component whose goal is to improve the efficiency of energy utilization in industry and other sectors.

The project design concept for the supply side component was based in the trends and directions which the power sector was taking in the late 1980's. Those trends indicated that India's power needs were surpassing its power supply and the gap was widening at an increasing rate. The power sector was dominated by public sector principally by the State Electricity Boards (SEB's) in generation, transmission, and distribution. Most of the SEB's were not efficiently managed and suffered from policy and legislative strictures which generally prevented even the few PSU's which wanted to improve their performance. However, at that time, there were no policy measures which could have allowed for alternatives to public management of the sector to occur. Therefore, the World Bank, Asian Development Bank, and USAID/India agreed to work together with a relatively new organization, the Power Finance Corporation (PFC), to promote incremental improvements

in the systems, personnel, and structures of the SEB's in order to improve the performance of the power sector.

Thus, the Power Finance Corporation (PFC) became the Indian implementing agency for the energy supply component. PFC is a major source of financing for the State Electricity Boards (SEB's) outside of and in addition to Central Budget allocations to the states. The PFC provides technical assistance, training and studies for the rehabilitation of existing facilities and the construction of new facilities for power generation, transmission and distribution as well as to promote increased SEB operational efficiency and economic viability. To fulfill its role as a development bank, PFC requested assistance from USAID to: 1) strengthen its own organization and personnel; 2) enhance PFC's capacities to provide assistance to SEBs in their preparation and implementation of Operational and Financial Action Plans (OFAPs), which are organizational development plans on the basis of which lending will be approved; and 3) complete various technical and policy-oriented studies. The World Bank and Asian Development Bank (ADB) provided loans totaling $515 million to PFC for on lending for the SEBs linked to the institutional development to be accomplished principally by the EMCAT supply side component. USAID, under the EMCAT Project, is financing technical assistance, training and studies for the PFC as well as the SEBs to achieve institutional development in those organizations.

The energy efficiency/demand side management component of the EMCAT Project is being implemented through the Industrial Development Bank of India (IDBI), the country's leading national-level development finance institution. The component, through provision of technical assistance, training and studies will strengthen the efforts of IDBI in support of energy management and energy conservation. The direct beneficiaries of EMCAT on the demand side will be the private enterprises, which reduce energy consumption and improve their energy efficiency. The other beneficiaries will include private consulting firms, industry associations and other organizations, who as a result of having received assistance through the EMCAT project would be able to provide better services to their customers.

B. PROJECT FUNDING:

The EMCAT project was authorized in 1991 by USAID with a total Life of Project (LOP) funding of $ 20.0 million, out of which $ 14.0 million was allocated to the PFC component and $ 6.0 million to the IDBI component. In September 1994, the project was amended to include a separate activity to support private power development activity titled "India Private Power Development" under the PFC Component for which an additional funding of $ 2.0 million was provided, thereby increasing the LOP funding to $ 22.0 million and the total funding for the PFC Component to $ 16.0 million. The Host Country Contribution to the project is budgeted at $7.3 million. Another activity focussed on policy development for commercialization of renewable energy technologies has recently been included under the IDBI component with an additional funding of $ 5.0 million. Addition of this activity would increase the LOP of the EMCAT Project to $ 27.0 million with a corresponding increase in host country contribution. The total funding for the IDBI component will increase to $ 11.0 million. As of June 30, 1995, the total obligation under the project is $17.0 million and the cumulative expenditure is $7.3 million.

C. PROJECT IMPLEMENTATION:

For the Energy supply component, U.S-based. technical assistance and training is being provided through a contract executed with Bechtel Corporation. The contract provides for technical assistance of 400 person weeks by U.S. experts in India and 1,500 weeks of training in U.S. for PFC and SEB personnel. In addition, there is a provision for 80 person weeks of study tours to U.S., and procurement of U.S. commodities worth $ 225,000. The contract with Bechtel Corporation was signed in April, 1993 for a period of four years till

March, 1997. For implementation of the Bechtel contract, a resident advisor is positioned in India in May, 1993 on a full time basis for the entire duration of the contract.

In addition to the services being provided through the Bechtel contract, the project also supports local training in India through PFC as well as provision of local technical assistance and conduct of policy studies through Indian institutions. Another major activity conducted under the energy supply component was a model power plant life assessment study conducted through a Participating Agency Services Agreement (PASA) executed with the Pittsburgh Energy Technology Centre (PETC) of the U.S. Department of Energy. The study was conducted by U.S. experts (led by Tennessee Valley Authority) in association with Indian agencies including National Thermal Power Corporation, Bharat Heavy Electrical Limited and PFC with the objective of transfer of technology and development of expertise/skill in the Indian institutions/utilities so that further similar studies could be conducted by these agencies on their own. The model study was conducted at the Chandrapura Thermal Power Station of Damodar Valley Corporation located near Dhanbad in the state of Bihar. As a part of this study, technical personnel and managers from the Indian agencies were provided extensive training in life assessment techniques at U.S. utilities and other organizations in U.S.

For implementation of India Private Power Development (IPPD) activities, a contract has been executed with K&M Engineering and Consulting Corporation. The contract, which was executed in April, 1995 for a period of two years (till March 1997), provides for 60 person weeks of technical assistance by U.S. experts and 40 person weeks of study tour to the U.S. and procurement of $ 60,000 of U.S. commodities. For implementation of the activities under this contract, a Resident Advisor (RA) is based in India on a full time basis for the entire duration of the contract.

For the energy efficiency/demand side management component, Resource Management Associates (RMA) is providing technical assistance services through a contract executed by USAID. This contract was executed in April 1994 for a period of three years and provides for 57 person months of technical assistance and procurement of $ 300,000 of U.S. commodities during the period of the contract.

The renewable energy development component will provide TA, training, and pre-feasibility and feasibility study support for the commercial development of renewable energy generation technologies. Services will be procured for its implementation in the next two months.

D. EVALUATION SCOPE:

The evaluation would cover both the energy supply component and the energy efficiency/demand side management component of the EMCAT Project.

ARTICLE I - TITLE

Project: Energy Management Consultation and Training, 386-0517

ARTICLE II - OBJECTIVE

To provide a team consisting of three U.S. and one Indian consultants which shall evaluate the above project and make recommendations to USAID/India regarding the relevance, effectiveness, efficiency, impact and sustainability of the project activities.

ARTICLE III - STATEMENT OF WORK

The Contractor shall conduct an evaluation and submit a report which provides empirical findings to the concerns listed below, conclusions (interpretations and judgments)that are based on the findings, and recommendations based on an assessment of the results of the evaluation exercise. Also, the evaluation report should provide lessons learned that may emerge from the analysis.

The key concerns to be addressed by the evaluation team are listed below:

1. RELEVANCE: (a) In view of the changing Indian power sector scenario and the developments in the past four years, is the original design concept still valid? (b) are the project activities originally proposed still relevant? If so, how should the project activities be modified/amended to meet the current requirements, both for the supply component and the energy efficiency/demand side management component?

Specific Issues for the supply side component to be addressed also are :

1. How valid are the terms of reference in BECHTEL's contract relative to the Indian power sector trends and issues of 1995-2000? i.e. privatization (generation and distribution), tariff reform, overhaul of SEB's into utility commissions, importance of private and increasingly foreign finance, etc.? How can it most effectively support the desirable trends in the power sector?

2. What has been PFC's role in the power sector over that time? What have been the responses of the PFC to the changes in the power sector? What recommendations can be developed that are or not being considered in this regard by the PFC?

3. Should EMCAT project directly work with other institutions/organizations in the energy sector instead of/in addition to PFC and if so identify the suitable organizations and specific areas in which the project should focus on?

4. How can the new Indian Private Power Development (IPPD) activity be most usefully integrated with the BECHTEL contract program as a total package to meet the needs of EMCAT to respond to the changed power sector?

5. What is the best role for the expanded scope of the BECHTEL resident technical advisor?

Specific Issues for demand side component to be addressed also are:

1. Is the original concept and are the sub-components still relevant to meet the EMCAT objectives?

2. Is there a need for changes in the component's activities to better meet the project objectives?

2. EFFECTIVENESS: Is the project achieving satisfactory progress towards its stated objectives and how should the project maximize its achievements during the remaining implementation period? USAID requests the evaluation team to specifically examine the following issues for the supply side and energy efficiency/demand side management components:

Energy Supply Component:

1. Review of the progress of the activities under the various project elements with specific emphasis on the activities under the Bechtel contract and whether any changes are needed in the activities planned for the next eighteen months under the Bechtel contract.

2. Examination of the implementation procedures including role of counter part institutions, contractor, etc.

3. Are steps in place and implementation plans in order to meet the project objectives as related to the energy supply component?

Energy Efficiency/Demand Side Management Component:

1. Review of the activities under the various project elements for the demand side component including the activities under the RMA contract and whether any changes are needed in the activities planned for the next 18 months to meet the current requirements of the project?

2. Are steps in place and implementation plan in order to meet the objectives of this project?

3. How have the grants provided to various Indian Institutions be useful in promoting energy efficiency and is there a need for making any improvements in the system being followed for the review of the proposals and sanction of grants?

4. Integration of activities in energy efficiency under the EMCAT project with the proposed activities under USAID's new project Environmental Protection Initiative (EPI) currently under design.

3. EFFICIENCY: Are the effects of the project being produced at an acceptable cost compared with alternative approaches to accomplishing the same objectives?

4. IMPACT: What has been the impact of the project based on the purpose level indicators specified in the Logical Framework matrix and how should the project maximize the impact? How are the indicators as mentioned in the original project logframe (as revised) relevant now and is there need for making any changes in the indicators? Evaluators are requested to include the evaluation of the impact of the contractor's activities under the supply side and demand side including the following:

1. What has been the impact of BECHTEL and RMA TA interventions?

2. What has been the impact of BECHTEL training courses and workshops and RMA training?

1. and 2. would mean some data collection prior to the actual evaluation team's work by the team from inputs supplied by USAID, Bechtel, RMA, K&M Engineering., PFC and IDBI.

5. SUSTAINABILITY: Are the effects of the project likely to become sustainable development impacts -- that is, will they continue beyond the project assistance completion date?

6. HOST COUNTRY CONTRIBUTION (HCC): Evaluators are requested to report on the adequacy and reliability of the HCC.

7. PROJECT ASSISTANCE COMPLETION DATE (PACD) EXTENSION: Even though the project agreement was executed in 1991, the implementation of the various activities under the project effectively started only in middle of Sept., 1993. One of the reasons for the delay in commencement of implementation was the fulfillment of the project conditionality relating to the World Bank loan to PFC being approved. There was also delay in the selection and execution of the contracts for provision of

technical services for the project. The Contract with Bechtel for the activities related to the energy supply component was executed in April 1993. In respect of the energy efficiency/demand side management component, the contract with RMA was executed in April 1994, even though two major studies - one on "Cogeneration in Sugar Industry" and another on "Energy Service Companies" were completed prior to the execution of contract with RMA. Under the supply side component a PASA with U.S. Department of Energy for Power Plant Life Assessment Study was executed in March 1993 and the study has since been completed.

The inclusion of the new component on private power support was done in 1994 and a contract with K&M Engineering for activities for Private Power Development was executed in April 1995. The modification of the project to include support for commercialization of renewable energy technologies was undertaken recently and the contracting action for procurement of services for this activity is expected to be completed by September/October 1995.

These developments need to be looked at from the point of view of the current Project Assistance Completion Date (PACD) of March 31, 1997. In the light of the above, the need for extension of the PACD is to be reviewed and recommendation made on the issue of the suitability of a PACD extension to meet the project objectives.

ARTICLE IV - REPORTS

1. The contractor must submit a final evaluation report and complete the abstract and narrative sections of the AID Evaluation Summary (AES) form in accordance with the requirement specified below upon completion of the assignment. Three days prior to departure from New Delhi, the consultants must submit a draft report to USAID/India and also arrange to debrief the USAID staff and PFC/IDBI. The team leader must ensure that all comments on the draft report are incorporated and the final report submitted at the earliest after the completion of the assignment along with the AES;

2. USAID's required format for evaluation report is as follows:

-- Executive Summary

-- Project Identification Data Sheet (see Annexure 2)

-- Table of Contents

-- Body of the Report

-- Appendices

The executive summary should state the development objectives of the EMCAT; purpose of the evaluation; study method; findings, conclusions, and recommendations; and lessons learned about the design and implementation of EMCAT project (See Annexure 3 for more detailed instructions.)

The body of the report should include discussions of (1) the purpose and study questions of the evaluation; (2) the economic, political, and social context of the project; (3) team composition and study methods (one page minimum); (4)evidence/findings of the study concerning the evaluation questions; (5) conclusions drawn from the finding, stated in succinct language; and (6) recommendations based on the

study finds and conclusions, stated as actions to be taken to improve project performance. The text should not exceed 30 to 40 pages with more detailed discussions of methodological or technical issues placed in appendices.

Appendices should include a copy of the evaluation scope of work, the most current Logical Framework as pertinent, a list of documents consulted, and individuals and agencies contacted. Additional appendixes may include a brief discussion of study methodology and technical topics if necessary.

3. A sample copy of the AES is provided in Annexure 4.

ARTICLE V - RELATIONSHIPS AND RESPONSIBILITIES

The team will work under the technical directions of Dr. David Hess, Deputy Office Director and Mr.N.V.Seshadri, EMCAT Project Officer in the Energy,Environment and Enterprise (E3) office. The team may also draw support from the Office of Project Design, Implementation and Training (PDIT) which coordinates all USAID evaluations. All coordination with the Government of India, PFC, IDBI and other institutions will be coordinated through the E3 office.

ARTICLE VI - PERFORMANCE PERIOD

The period of performance will be from December 29, 1995 to February 29, 1996.

ARTICLE VII - WORK DAYS ORDERED

Position	Work Days
1. Sr. Development Management Specialist/Team Leader	32
2. Sr. Development Management Specialist (two experts)* (32 days for Mr. Addison and 24 days for Mr. Dhar)	56
3. Indian Power Sector Specialist	24

*One expert for the energy supply component and one expert for the energy demand component who also would have some experience in the field of renewable energy.

Work days include interviews in the United States by the team leader, travel from United States to New Delhi by three U.S. experts, stay and work in India of all team members, travel within India by all team members for interviews with EMCAT participating agencies, travel to United States by three U.S. experts and work in United States by team leader for finalizing report.

ARTICLE VIII - SPECIAL PROVISIONS

A. DUTY POST

New Delhi

B. LANGUAGE REQUIREMENTS AND OTHER REQUIRED QUALIFICATIONS

English. The team leader and the experts should have excellent skills and ability to present the findings and report them in such a manner that further action could be taken on the recommendations made. The technical qualifications and experience requirements for the experts are provided in enclosure.

C. ACCESS TO CLASSIFIED INFORMATION

The Contractor shall not have access to any Government classified material.

D. LOGISTIC SUPPORT

USAID/India will provide background material to the team. USAID will also provide the office space required for the team. All other logistics and secretarial support must be arranged by the contractor.

E. WORK WEEK

A six-day work week is authorized.

Enclosure to Attachment 'A'

Technical Qualifications and Experience Requirements for the Evaluation Team

A team consisting of four members would have to be provided with the following specialty and experience. Of the four members, one would be an Indian expert and other three would be from the U.S.

1. A team leader who will be responsible for this activity and who will also coordinate the work of the other team members. The team leader should have extensive experience (no less than 15 years) in the energy sector in general and in particular in all aspects of electricity generation preferably in developing countries. He/she should also be well versed with the current developments in power sector world wide and should have knowledge and experience of the changes occurring in this sector in other countries, apart from the U.S. particularly on privatization, regulation and tariff reforms. He/she should have experience of the working of development institutions and should have excellent communication skills, both oral and written.

2. An expert in electrical power generation (including transmission and distribution) who would be the main team member responsible for evaluation of the energy supply component of the project. The individual being proposed for this position should be knowledgeable both on the technical and institutional aspects of power generation, and power utility management including independent private power development. He/she should be well versed with the international developments in power generation and have knowledge of the experience of other developing countries with regard to major power sector reforms including restructuring. He/she should have had extensive (more than 15 years) international experience and also must be well versed with the developments in the U.S. in this field and their application to other countries.

3. An expert on Energy Efficiency and Demand Side Management (DSM) who would be the team member primarily responsible for evaluation of the energy efficiency/demand side management component of the project. The individual being proposed for this position should have more than 10-15 years experience in various aspects related to energy efficiency and demand side management. He/she should be fully aware of the U.S. experience on energy efficiency and the energy efficiency programs in other countries. He/she should have had experience in implementation of various programs on energy efficiency. This expert should also have familiarity with developments in the field of commercialization of renewable energy technologies like solar, wind, mini-hydro and biomass power generation. He/she should be conversant with renewable energy commercialization activities in various countries apart from the U.S. The

expert would provide recommendations for implementation of the renewable energy activities under the Energy Efficiency component of the project, that has been recently included.

4. An Indian expert with experience of management of the power sector. The expert proposed for this position should be a very senior level person (more than 15 years experience) who has intimate knowledge of the Indian Power Sector and the various issues facing this sector. He/she should have excellent contacts, both in the government and in the private sector in India and should be able to provide the link for the evaluation team in terms of its interaction with Indian institutions as well as provide necessary inputs for the evaluation team. This expert should be conversant with the various GOI policies in general and with the policies for the power sector in particular.

APPENDIX 2 EMCAT LOGICAL FRAMEWORK

ENERGY MANAGEMENT CONSULTATION & TRAINING PROJECT (386-0517)
REVISED LOGICAL FRAMEWORK MATRIX

NARRATIVE SUMMARY	**OBJECTIVELY VERIFIABLE INDICATORS**	**MEANS OF VERIFICATION**	**IMPORTANT ASSUMPTIONS**
Program or Sector Goal:	Measure of Goal Achievement		
To improve the efficiency of both energy supply and its utilization	(i) Reduction in T&D losses by 5 percent	CEA Statistics	Strong continued World Bank and ADB support for the Indian
in the industrial and other sectors			energy development program
including agriculture and commerce.	(ii) 5 percent increase in Plant Load Factor (of thermal Power Plants)	Reports of DOP and other GOI departments	
			Promotion of policies to encourage power generation by private utilities
	(iii) Decreasing trend in the utilization of captive diesel power plants	Industry records	
			Increased GOI investment in T&D
		Industry association reports	
	(iv) Energy and/or electricity usage reduction in energy- intensive firms	Pre and post audit and pre feasibility study records of firms, study reports	
	targeted by EMCAT averaging 15%	and follow-up survey performed by EMCAT	
	(v) Energy efficiency investments directly related to EMCAT support in		
	at least 10 firms		
Project Purpose:	End of Project Status		

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
To improve India's technological and management capabilities for the	Utility transmission and distribution losses reduced	Planning Commission, Ministry of Power and other GOI reports	Liberalization of government policies to promote import and domestic
supply of energy and for the			manufacture of energy equipment
efficiency of its end-use by private industry and other sectors, including	Increased power generation capacity through SEB purchase of power		
commerce	flowing from industrial cogeneration	Industry visits	Imposition of conditionalities by PFC for lending to the SEBs
	Increased use of energy efficient technologies in selected	Loan agreement of DFIs for cogeneration	
	energy intensive industries		World Bank and ADB support the Indian energy program
	Increased promotion of energy conservation and policy reforms by	Mid-term and final Evaluation	
	industry and business associations	Reports of the project	Successful policy dialogue leading to policy reforms regarding energy
			pricing and avoided cost formulas,
	Institutionalization of DSM programs in SEB's or private utilities, and energy	Industry association reports and meetings	import and domestic manufacture of equipment
	efficiency audits and audit training in energy associations, NPC, CII or		
	other appropriate entities.		
		Ministry of Industry reports	
	Establishment of viable Energy Efficiency Companies (ESCO's)		
		Other site visits	

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
		Industry surveys before and after technical assistance and IDBI loans,	
		industry data on norms and practices.	
Project Outputs:	Magnitude of Outputs		
Energy Supply Component		ICICI records & reports	Department of Non-conventional Energy Sources can coordinate with
			ICICI and other members or the
Operational and financial action plans (OFAP) prepared and used	Incorporated in all major SEBs		Advisory Committee to solicit, review, and approve suitable
		MNES records and reports	proposals and to promote project activities.
Training of Officers in analytical and planning techniques	100 Key officers of PFC and SEB trained		
PFC and SEB operating personnel trained in areas such as plant	250 PFC and SEB operating personnel trained	Independent review	SEBs amenable to planning interventions
modernization techniques.			
T&D loss reduction techniques etc.		Company records	Incentives provided for conduct of energy audits
Pre-investment and feasibility studies	20-30 studies completed	PFC and IDBI monitoring reports	Industry associations take active interest in energy
			conservation
Policy-oriented studies	A series of 10 studies conducted and disseminated		

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Plant life extension demonstration	One demonstration unit established for demonstrating life extension methodology		Users amenable to audits
Energy end-use efficiency component:			
Loan Portfolio Development		Post-Survey of Industries regarding study quality, actions and investments resulting	Availability of IDBI and ADB loan funds
			Continued reform in energy price policy
Private Sector Consulting		Project seminar & contractor trip reports	SEB's and MOP policy on power purchase, wheeling and contracts
Promotion of ESCO concept	Formation of at least 5 ESCO's. Demonstrated commercial viability of	Survey of ESCO's	is conductive to ESCO's.
	2 ESCO's.	Course records, post-course evaluations, and sample survey and interviews of	
Energy audit improvement	Energy audit training of 94 trainees.	participants	Energy prices continue to be rationalized
	Establish sustainable audit training in at least 1 Indian institution	Project records, and sample survey of recipients	
	23 audit firms provided diagnostic instruments for energy audits	Workplans, contractor studies, site visit to utility	
Pilot DSM studies	Prepare DSM dissemination proposal for WB/ADB of other support		
Energy efficiency workshops	Conduct 1 regional and 1 national workshop	Project workplans, contractor progress reports, sample survey of participants,	

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
		interviews with trade associations	Continued liberalization of Indian economy
	Conduct 2 study tours		
US study tours			Continued improved business conditions
	Conduct 1 trade mission		
	5 business associations strengthened to provide energy services and promote reforms		
Trade missions to India			
Project Inputs:	Implementation Targets		
USAID grant - $20.0M	USAID - TA, training, commodities, studies, consultancy etc. GOI/Private	Monitoring reports, financial statements, field visits etc.	USAID and GOI provide inputs on a timely basis
	Sector-Personnel cost of IDBI and PFC		
GOI & private sector - $6.6 M	counterparts, facilities, international travel cost of Indian participants etc.		
BREAKDOWN			
Energy Supply Component			
USAID - 14M			
T.A. 5.5M, Training 4.7M, Commodities 0.8M			
Administration 0.9M, Contin and Infla 2.1M			
GOI - 4.6M			

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
T.A. 1.5, Training 1.8, Commodities 0.1M,			
Administration 0.4, Contin and Infla 0.8M			
Energy end-use component:			
USAID - 6M			
T.A. 2.6M, Training 0.6M, Commodities 1.8,			
Project Admin 0.1, Contin and Infla 0.9			
GOI - 2M			
T.A. 1M, Training 0.1M,			
Commodities 0.5M, Contin and Infla 0.4M			

APPENDIX 3 SURVEY INSTRUMENTS USED IN EVALUATION

BESP Surveys

EMCAT MID-TERM EVALUATION
CONTRACTORS QUESTIONNAIRE

A. Introduction

Thank you for participating in the EMCAT mid-term evaluation study. We are interviewing USAID/India EMCAT project staff, Contractors, PFC staff, and SEBs to determine the impact of the EMCAT program on power supply side in the areas of: a) Supply side efficiency improvement (Bechtel contract); and b) Private power development program (K&M contract). To carry out this evaluation we would appreciate you input to understand whether the EMCAT project services are meeting needs in the above two areas under the recent years structural changes in the power sector. All results will be kept strictly confidential.

B. Project Design Aspect

1) Are Scopes of Work Clear ?

a) Yes b) To Some Extent c) No

Comments: _____

_____

2) Is Your Project Workplan Relevant for The Power Sector Structural Changes ?

a) Very Useful b) Useful, but not vital c) Irrelevant

Comments: _____

_____

C. Project Achievements

1) What has been the receptivity of your activities by the PFC and SEBs ?

PFC: _____

_____

SEB: _____

_____

Comments: _____

_____

EMCAT MID-TERM EVALUATION
QUESTIONNAIRE FOR PFC & SEBs STAFF

A. Introduction

Thank you for participating in the EMCAT mid-term evaluation study. We are interviewing USAID/India EMCAT project staff, Contractors, PFC staff, and SEBs to determine the impact of the EMCAT program on power supply side in the areas of: a) Supply side efficiency improvement (Bechtel contract) and b) Private power development program (K&M contract). To carry out this evaluation we would appreciate you input to understand whether the EMCAT project services are meeting needs in the above two areas under the recent years structural changes in the power sector. All results will be kept strictly confidential.

B. General Questions

1) Are you still in the same job as when you attended training ?

R Yes **R** No

2) If you are in another job, is it strongly related to previous jobs, i.e., the same skills and knowledge base are required ?

R Yes **R** No

3) Course Attended: _____

4) SEB: _____

5) Area of Responsibility: _____

C. Course Specific Questions

1) How would you rate the relevance of the Training Modules (Trs), Technical Assistance Modules (Tas), and Study Tours (STs) subject matter to your work?

R Strongly Related **R** Moderately Related **R** Unrelated

2) Was the material covered in the course?

R Too Difficult **R** Challenging but Moderate **R** Too Basic

3) How would you rate the amount of time given to cover the subject?

R Not enough time **R** Enough time **R** Too much time

4) Would you say the Trs, Tas, and Sts were:

R Mostly Practical **R** Mostly Theory **R** Both Theory and Practice

5) Did the course use examples which were relevant to your needs? i.e.: You attended a project appraisal course which used generation to illustrate the problem but your work was mainly in T&D?

R Examples were Relevant **R** Examples were not Relevant

6) Did the instructors attempt to relate the course material to how it could be used in an Indian context?

R Yes **R** No

7) Has follow on training been provided?

R Yes **R** No

8) Has this course enabled you to perform your job better or has it prepared you better for your future work?

R Yes **R** No

9) Have you been satisfied with the selection process of EMCAT participants for Training or Study tours ? If not, what changes should be made to facilitate the inclusion of the most appropriate trainees ?

Comments: _____

_____

Summary

If you benefitted from the course, please explain how:

If you did not benefit from the course, please explain why:

What topics would you like to see covered in future training courses?

Additional Comments:

D. Institutional Development

1) What projects have you carried out as a follow-on to work initiated by one of the EMCAT project components?

Comments:

2) Can you attribute that follow-on work to: a) a specific EMCAT project initiatives or b) to the EMCAT program in general ?

Comments:

3) So far, were all your expectations of the EMCAT project met ? If not, please elaborate:

Discussion: _____

_____

4) Have any change of EMCAT project scope or recommendations by your organization been implemented in the training program and/or in the technical assistance component ? If not, please discuss.

Discussion: _____

_____

E. Information Dissemination

1) How did you find out the USAID EMCAT project portfolios ?

- **Q** PFC Project Managers
- **Q** PFC Announcements
- **Q** USAID Mission Program Announcements
- **Q** Other _____

2) Do you believe that you have adequate knowledge of the EMCAT project portfolio? not, what would be helpful?

Comments: _____

_____

F. Future Activities and Priorities

1) Please rate the following potential areas of future EMCAT project activities in terms of their relevance to PFC and SEBs priorities:

Scale: 1- Very Critical 2- Very Useful 3- Useful, but not vital 4- Not Useful

a) Power Sector Reform Process	1	2	3	4
b) Regulatory Institution Development	1	2	3	4
c) PFC's Institutional Development	1	2	3	4
d) Private Power Development Program	1	2	3	4
e) Private Power Financing Process	1	2	3	4
f) Transmission Wheeling/Access Issues	1	2	3	4
g) Transmission BOOT Project Development	1	2	3	4
h) Environmental Protection/Mitigation 1	2	3	4	
i) Transmission Wheeling/Access Issues	1	2	3	4
j) Transmission BOOT Project Development	1	2	3	4
k) Environmental Protection/Mitigation 1	2	3	4	
l) Distribution Utility Privatization	1	2	3	4
m) Utility Assets Valuation	1	2	3	4
n) Project Appraisal Activities	1	2	3	4

o) Policy and Pricing Reform	1	2	3	4
p) Financial Management Training of SEBs	1	2	3	4
q) Training Activities:				
- In Country	1	2	3	4
- In United States	1	2	3	4

2) Is there anything EMCAT can do to improve or enhance the range of services available to PFC and SEBs ?

Comments: _____

_____

3) Are there any types of power sector related training programs that were rejected by the EMCAT Advisors that you thought were worthy ?

Comments: _____

_____

4) Have Training/Technical Assistance/ Study Tours/ Workshops, etc. helped to justify or led to organizational changes in your institution ?

Comments: _____

_____

5) What recommendations can you give to help the EMCAT project better suit your needs ?

_____

_____

End-Use Efficiency Questionnaires
Management Systems International
600 Water Street, S. W.
Washington, D.C. 20024

Mid-term Evaluation of the Energy Management Consultancy and Training Project (EMCAT)

Questionnaire for Industrial Development Bank of India:

USAID India is currently conducting its Mid-term Evaluation of the Energy Management Consultancy and Training Project (EMCAT). The evaluation is to assess the project's relevance to India's needs, effectiveness, cost-efficiency, potential impact, as well as impact to date, sustainability of outputs, host country contribution, and schedule.

In general terms, the purpose of the EMCAT project is to improve India's technological and management capabilities for the efficient supply and end-use of energy by private industry and other sectors. The project also intends to strengthen the IDBI's capability and efforts in support of improved energy management and energy conservation.

Since the IDBI is the implementing agency and counterpart agency for the demand-side of the EMCAT project, it is extremely important for the evaluation team to have the benefit of specific information on IDBI EMCAT activities. This information is needed by January 17th, and can be provided directly to the evaluation team through Mr. N.V. Seshadri, Project Officer USAID New Delhi or may be brought to the EMCAT PRC meeting on the 18th in Ahmedabab if more convenient.
Thank very much for your cooperation.

The following information is requested in support of the USAID evaluation:

1. EMCAT was designed to provide technical assistance in support of the World Bank Industrial Energy Efficiency Project (IEEP), which project was not implemented by the WB. Given this lack of funding, what alternative amounts and sources of funds are intended to be used for efficiency lending?

2. What are the IDBI's current energy efficiency lending targets and related loan program (as contrasted with its technical assistance program) for efficiency lending? For example, what promotion, outreach, loan criteria, incentives, initiatives or policies exist specifically for this sector.

3. Please describe the current IDBI counterpart staffing for the EMCAT project. Please provide names, titles, professional backgrounds, % of time committed to participating, and main EMCAT and non-EMCAT functions and responsibilities?

4. Please describe the role of EMCAT in identifying, leveraging and directly supporting operational IDBI lending, as this process currently functions, and/or is planned to function?

5. Please identify any prospective or completed IDBI lending which has been directly assisted by the EMCAT project? What is the amount, type (that is, technologies or nature of investments) and sector and status of this proposed lending?

6. For background purposes, a description of past energy efficiency lending (or selected examples) by IDBI would be appreciated?

7. In order to understand both the cost of loan funds and prospective terms to EMCAT assisted borrowers, it would be very helpful to have documentation which would describe IDBI general lending policy, main sources and cost of loan funds, interest rates and terms applied by category of lending?

8. Please describe energy efficiency lending or promotion activities other than EMCAT which are undertaken by IDBI? What are the main goals and types of outputs produced by these activities?

9. ESCO activities-What is the status of development of a specific lending and/or promotion role for IDBI in financing ESCO's?

10. Could you please provide your view of the extent to which the EMCAT demand-side project objective and specific outputs have thus far been achieved? For example, the USAID project documents anticipated the achievement of the following by project component:

a. Loan portfolio component: RMA to do 15 sectoral/industry studies, IDBI 30 more

b. Private sector consulting component:

- Energy audit improvement program-training of 70 private engineering consultancy firms.

- Provision of 50 engineering firms with diagnostic instruments for energy audits.

c. ESCO promotion component:

- Formation of at least one ESCO

d. DSM component: Development of one DSM pilot project

e. Information dissemination

- Trade shows, reverse trade missions, workshops, ...

f. Policy studies:

11. Finally, what changes, if any, in the management, scope and outputs of the EMCAT project would you suggest to redirect and/or improve this project?

12. Counterpart Contribution:

It would be appreciated if the IDBI could provide the most recent information on the Host Country Contribution (US$'s or Rs @ exchange rate.....)

CATEGORY	AMOUNT BUDGETED	LOCAL SOURCE	ACTUAL EXPENDITURES	REMAINING AMOUNT
1. Loan Portfolio				
a. Leveraging public-private financing				
b. Bankable preinvestment energy efficiency studies				
2. Private Sector Consulting				
a. Energy audit improvement				
b. Promotion of ESCO's				
c. Pilot DSM studies				
3. Information Dissemination				
a. Energy efficiency workshops seminars				
b. U.S. study tours				
c. Reverse trade missions				
4. Local Commodities				

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Washington, D.C. 20024

Mid-term Evaluation of the Energy Management Consultancy and Training Project (EMCAT)

Questionnaire for ESCO's - Ahmedabab Electricity Company

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In general terms, the purpose of the EMCAT project is to improve India's technological and management capabilities for the efficient supply and end-use of energy by private industry and other sectors. The project also intends to strengthen the IDBI's capability and efforts in support of improved energy management and energy conservation.

Firm Name:_____Date:_____

Address:_____Phone #:_____

Interviewee:_____Interviewer:_____

Type of Enterprise (Product/Service Provided):_____

_____

Date Firm Established:_____No. of Employees_____

1. Please provide a description of your DSM and efficiency program, including budget, staffing and schedule?

2. What role has AID support through the EMCAT project, or other means (or other donors) had in the: a Initiation, b Technical design, c planning and d outputs from DSM or other efficiency activities?

3. Has support provided by EMCAT been adequate in technical scope, quality, amount, timing, availability locally versus in the US?

4. What changes in the type, scope or amount of EMCAT support would you recommend?

5. What are the general investment or financial criteria in your opinion used by industrial, commercial firms or households in evaluating and selecting DSM or efficiency investments?

6. What are your current tariff policies as regards power factor, demand charges, interruptible rates, time of day metering, and block rate structure?

7. How is DSM intended to related to your supply planning and construction?

8. How is DSM or other efficiency integrated with, related to your operations (load shedding, to meet imminent problems, in developing future plans,...?)

9. Do your have any other comments or advice on how DSM could be more effectively supported by the EMCAT project?

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Mid-term Evaluation of the Energy Management Consultancy and Training Project (EMCAT)

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In general terms, the purpose of the EMCAT project is to improve India's technological and management capabilities for the efficient supply and end-use of energy by private industry and other sectors. The project also intends to strengthen the IDBI's capability and efforts in support of improved energy management and energy conservation.

Questionnaire for ESCO's - Energy Efficiency Investment Candidates

Firm Name:_____Date:_____

Address:_____Phone #:_____

Interviewee:_____Interviewer:_____

Type of Enterprise (Product/Service Provided):_____

_____

Date Firm Established:_____No. of Employees_____

1. What type of energy efficiency consultancy, cogeneration, independent power generation or shared-savings activities are undertaken by your firm?

2. Where do the above services or activities take place?

3. What is the number or volume of such activities annually? What proportion of your overall business is comprised of the above energy efficiency type activities?

4. What role has AID support through the EMCAT project, or other means (or other donors) had in the initiation, technical quality and effectiveness, or other impacts, on your energy efficiency activities?

5. Was support provided by EMCAT adequate in technical scope, quality, amount, timing, availability locally versus in the US?

6. What changes in the type, scope or amount of EMCAT support would you recommend?

7. What are the general investment or financial criteria used by industrial firms for evaluating and selecting efficiency investments?

8. What other non-financial criteria or requirements are part of investment decisions?

9. What are the principal constraints to increased energy efficiency, especially ESCO projects and contracts? (e.g. availability of financing, lack of business understanding of benefits, difficulty in fairly sharing returns, other)

10. What role might the EMCAT play in assisting to address these constraints?

11. How is your company going about addressing constraints to ESCO agreements and projects?

12. Do your have any other comments or advice on how energy efficiency investments could be more effectively stimulated by the EMCAT project, through the private sector or by the Government?

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600 Water Street, S. W.
Washington, D.C. 20024

Mid-term Evaluation of the Energy Management Consultancy and Training Project (EMCAT)

USAID India is currently conducting its Mid-term Evaluation of the Energy Management Consultancy and Training Project (EMCAT). The evaluation is to assess the project's relevance to India's needs, effectiveness, cost-efficiency, potential impact, as well as impact to date, sustainability of outputs, host country contribution, and schedule.

In general terms, the purpose of the EMCAT project is to improve India's technological and management capabilities for the efficient supply and end-use of energy by private industry and other sectors. The project also intends to strengthen the IDBI's capability and efforts in support of improved energy management and energy conservation.

Questionnaire for Industrial Firms - Energy Efficiency Investment Candidates

Firm Name:_____Date:_____

Address:_____Phone #:_____

Interviewee:_____Interviewer:_____

Type of Enterprise (Product/Service Provided):_____

_____

Date Firm Established:_____No. of Employees_____

1. What are the primary energy sources used by this firm? What proportion of operating costs is comprised of cost of fuels, cost of electricity?

2. When and by whom was an energy audit and/or prefeasibility for energy efficiency investments undertaken for your firm?

3. What were the main recommendations of that audit/study?

4. What were the financial returns or payback to these proposed investments and/or operating improvements?

5. What are the general investment or financial criteria used by your firm for evaluating and selecting investments?

6. What other non-financial criteria or requirements are part of investment decisions?

7. What in your opinion are the primary constraints faced by your firm in implementing such energy efficiency improvements?

8. Which, if any, of the proposed efficiency improvements or investments has been undertaken by the firm, is planned to be undertaken?

9. Which, if any, of the proposed efficiency improvements or investments has been rejected by the firm?

10. In your judgement what was the quality and usefulness of the energy audit or prefeasibility study done for your firm?

11. What cost or other support was provided by your firm for this audit/study?

12. Do your have any other comments or advice on how energy efficiency investments could be more effectively stimulated by the EMCAT project, through the private sector or by the Government?

APPENDIX 4 PERSONS INTERVIEWED

SUPPLY SIDE

Aggarwal, B. M.	VP, BD Somani Group, Hydro Developers
Ahuja, Ashok	Director NRECA International, Ltd.
Bakshi, Jitendra	Information Analyst,Tata Energy Research Institute
Bhattacharjee, Somnath	Dean-Energy Engineering, Tata Energy Research Institute
Borgstrom, Robert E.	EMCAT Resident Advisor, Bechtel
Dua, Ajay	Joint Secretary, Ministry of Power (Reform& Regulation)
Fafard, Charles	Director of Engineering, RMA
Hess, David	Deputy Director, Office of Environment, Energy & Enterprise, USAID
Goldman, Dick	Director, Office of Environment, Energy & Enterprise, USAID
Govil, K.K.	Director, Projects, PFC
Grover, S.P.	Member Technical (OP), Haryana SEB
Guha, Ajay	Project Implementation Officer, Asian Development Bank
Gulati, Mohinder	Financial Analyst, World Bank
Haldia, Ashok	Dy General Manager, PFC
Jain, R.K.	OSD to Chairman, Haryana SEB
Juneja, J.C.	Member Technical (G&P), Haryana SEB
Kohli, Naveen K.	Dy. Manager, EMCAT, PFC
Kohli, Uddesh	CMD, PFC
Manzo, Magdalena	Sr. Operations Officer, World Bank
Mathur, K.B.L.	Asst Economic Advisor, MOF, GOI
McDermott, Hugh	IPPD Resident Advisor, K&M Engineering
Mohanty, A.R.	Chief Engineer Transmission, Orissa SEB
Mohanty, Sanjay	Area Convenor Conventional Energy, Tata Energy Research Institute
Mohapaptra, S.K.	Former Chairman and Restructuring Advisor, Orissa SEB
Mostefai, Djamal	Sr. Energy Specialist, World Bank
Murahari, R.	Asst. Manager, EMCAT, PFC
Nanda, A.R.	Principal Secretary, Orissa Department of Energy
Nettleton, Frank	Training Specialist, Bechtel
Pachauri, Rajendra K.	Director, Tata Energy Research Institute
Patnaik, R.M.	Sr. Consultant, Orissa SEB
Pinto, M.P.	Chairman, Maharashtra SEB

Sankar, T.L.	Principal ASCI
Seshadri, N.V.	Energy Program Specialist, USAID
Shahi, R.V.	CMD Bombay SES
Somers, Ron	Managing Director, Cogentrix
Sparkes, Anthony	World Bank Power Specialist
Srivastava, Leena	Fellow & Dean Policy Analysis, Tata Energy Research Institute
Suri,L.R.	Sr. Fellow, Tata Energy Research Institute and Former Member CEA
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APPENDIX 6 ENERGY SECTOR REVIEW

INTRODUCTION

Any attempt to evaluate the past and forge the future rode of EMCAT would necessarily involve an assessment of the current status and emerging concerns of the Indian Power Sector. The relevance and effectiveness of the instrument cannot be isolated from the ground realities of the institutions.

THE ENERGY SCENE

2. Over the decades of developmental planning t:he energy scene in India has undergone a seachange. In 1950-51, more than 70% of the total primary energy supplies in India came from non-commercial sources, i.e., fuel wood, animal dung and agricultural residues. This share has come down to about 40% by 1990 91 and it is expected to go down further to around 30% in 1996-97. This has been due to significant growth in production and supply of commercial forms of energy like coal, hydrocarbons and electricity.

EVOLUTION OF ELECTRICITY INDUSTRY

3.1 There is no denying the fact that electricity as the most versatile form of energy warrants the highest priority. Supply o£ electricity commenced in India in the 1880s with the commissioning of a small 130 KW hydro electric plant at Darjeeling (West Bengal). A thermal power plant based on coal was set up in Calcutta in 1897. The next 50 years (i.e till Independence) the supply of electricity was confined mainly in and around urban centers, chiefly for lighting purposes and private enterprise was the prime mover.

3.2 Legal provisions to support and regulate the electricity sector were put in place through the Indian Electricity Act (1910). Shortly after independence, a second Act - the Electricity Supply Act 1948 - was passed with a view to establishing Electricity Boards in the States of the Union. The production of power was reserved for the public sector in the Industrial Policy Resolution of 1956. As a consequence, almost all new investment (barring those by existing "licensees") in power generation, transmission and distribution took place in the public sector.

ORGANIZATIONAL STRUCTURE

4.1 Under India's Constitution, electricity is a shared responsibility of both the Central and State levels of Government. Many agencies are involved at both levels and there is a degree of overlapping the jurisdiction. The basic institutional structure is as follows.

4.2 CENTRAL GOVERNMENT

Operating Agencies

There are two major National Power Companies, the NTPC (thermal) and the NHPC (hydro), bulk-supply utilities which produce about 30 per cent of the country's electricity, and sell it largely to the State Electricity Boards. There are also two nationally-owned regional power companies, and the Nuclear Power Corporation.

The Powergrid Corporation of India was established' in 1989 to create and operate an eventual national. grid.

Financing Agency

The Power Finance Corporation was set up in 1986 for providing assistance to certain priority areas of the Sector under the guidance and encouragement of the International Financing Agencies (World Bank and ADB). The intention was that this Corporation would also be an important instrumentality for bringing about improvements in the technical. and financial ,viability of the client utilities.

4.3 STATE GOVERNMENTS

About two-thirds of power generation and all transmission and distribution is in the hands of 18 State Electricity Boards which al.so have tariff setting and regulatory functions. At the intermediate level all the Regional Electricity Boards concerned with the 5 Regional interconnected systems (Eastern, Northern, North Eastern, Southern and Western). The Regional Load Despatch Centers are now being taken over by the National Power Grid Corporation.

4.4 Private Power General:ion

There are 5 private utilities involved in power generation and distribution. These are - Bombay Suburban Electricity Supply Ltd. (BSES) and Tata Electric Company (TEC), both in the Bombay area; Calcutta Electric Supply Company Ltd. (CESC); and Ahmedabad Electricity Company (AEC) and Surat Electric Company in Gujarat State - all accounting for about 5% of the power supply.

INDIA'S ENERGY RESOURCES

5. India is a net importer of energy (largely in the form of oil). In terms of conventional energy resources, India has:

- Coal - 192 billion tons (78 billion tons proven; 6% of proven world coal reserves).

- Oil and gas; 17 billion TOE (25% proven; 0.5% of proven world oil and gas reserves).

- Hydro - 84 GW (at 60% utilization factor, of which only 20 C,W has been exploited).

- Non-conventional Energy Resources, with varying range of technical feasibility and cost effectiveness, comprise wind power, mini hydro, tidal, biomass and solar power.

THE STARK REALITY

6. What the Indian Power Sector has achieved since the planning process began is undoubtedly remarkable. But what it needs to achieve is mind-boggling.

ACHIEVEMENTS SO FAR

7. The achievements so far can be briefly stated:

- The installed capacity has increased from around 1362 MW at the time of independence to about 82000 MW - thermal (71%), hydro (26%) and nuclear (3%).

- The number of villages electrified have risen from around 3000 to nearly 496,000 in 1995.

- Per capita consumption has risen from 15.5 kwh to 310 kwh.

- There has been simultaneous extension of transmission lines from 10,000 ckm to 2,36,000 ckm; 406kv lines alone since 1980 have risen from a length of 2340 ckm to 31834 ckm.

- In the last three decades, maximum growth in" consumption was registered under the "domestic" and "agricultural" consumer segments. The compounded annual rate of growth of these two sectors were 13.21% and 13.26% respectively over 1981-1990,

as against the overall growth rate of 8.74%. In the first 4 years of the current decade, the compounded annual rate of growths were domestic (10.49%) agriculture (12%) and overall (7.75%).

CHALLENGE AHEAD

8.1 Notwithstanding the impressive achievements of the past, the Indian Power Sector is beset with stupendous problems. A look at the shortage situation shows that while in 1991-92 the energy and peaking shortages were 8.5% and 19% respectively, the end of the Eighth Five Year Plan (1992-97) will witness an energy shortage of 14% and peaking shortage of 28%. For decades to come, the demand for electricity will be a steadily rising curve, thanks to the forces of industrialization, urbanization and all round development. This situation has been compounded by the fact that whereas the Eighth Five Year Plan had envisaged an addition of 30538 MW to installed capacity the likely addition would only be around 19000 MW.

8.2 The issues that confront the Power Sector should be seen in the proper perspective. Based on the 14th Electric Power Survey, CEA had prepared a National Power Development Plan in 1991 envisaging additional requirement of 142000 MW over three 5 years of plan periods. With the estimated annual growth rate of demand for electricity in the post liberalization period being around 9%, CEA has projected an additional capacity requirement of about 57000 MW for 1997-2002 and about 67,000 MW during the period 2002-2007.

THE STRATEGY - CRITICAL ISSUES

9. The tasks ahead are formidable and calls for a comprehensive strategy encompassing all sources of energy modes of generation and optimality of use. Such a strategy has to lay equal emphasis on supply side enhancement and demand side management. In the ultimate analysis the degree of success with regard to any or all of the objectives would critically depend upon the initiative to reform the State Power systems towards sound technical, financial, and commercial viability - which is perhaps the only sustainable approach to the critical issues that confront this sector today.

10.1 Any attempt to deal with the critical issues has necessarily to contend with an organic chain of processes and must recognize that the chain is only as strong as its weakest link.

10.2 Stated simply, there is need to ensure that:

- There is adequate, cost effective addition to installed capacity with due regard to environmental considerations.

- What is installed is "available" for generation.
- What is "available" is utilized for generation.
- What is generated is transmitted and distributed.
- What is distributed is metered.
- What is metered is billed at the appropriate tariff.
- What is billed its paid for and collected and
- What is paid for is consumed with clue regard to end use efficiency.

10.3 Stated differently on the supply side :

- Efforts have to be mounted to increase generation and to meet the hydro thermal mix essential for optimal power management.
- There has to be a planned and systematic reduction in transmission and distribution losses.
- Integrated operation of Regional Power Systems should culminate in the evolution of a National Grid.
- There must be improvement in the utilization of existing generation capacity with accent on plant availability and plant load factor.
- There is need for a systematic and well phased renovation and modernization programma covering both thermal and hydel stations backed by improved managerial practices and fuel supply arrangements.

10.4 Similarly demand side management should seek to:

- reduce the peak demand in the system without adversely affecting, the system energy requirement.

- put in place load management measures, both technical and commercial, aimed to flatten the load curve and to get the most out of the existing capacity at the least cost.

- place increased emphasis on energy conservation through a mix of policy instruments and strategies oriented to the ground realities of the industrial, agricultural, domestic and commercial sectors so as to reduce the intensity of energy consumption.

- and, last but not the least underscore the role of the "non-conventional" or "renewable energy" sector as a strong supplement to the conventional one with a view to tackling problems of logistics, ecology and above all, efficiency and equitable accessing of the rural areas.

1.CAPACITY ADDITION — PUBLIC SECTOR

11.1 "Capacity Addition" constitutes a colossal problem. As stated earlier CEA has protected an additional capacity requirement of about 57,000 MW for 1997-2002 and 142,000' MW for the time horizon 1992-2007. Judged by the past track record, a capacity addition of about 20,000 MW is expected in the public sector during the 9th Plan and 80,000 MW during the entire period 1992-2007. This leaves an uncovered gap of about 37,000 MW to be bridged by private sector investment during the 9th Plan and 80,000 MW during the period 1992-2007.

11.2 Public sector can no longer depend on budgetary support and it did in the past and shall have to unequivocally meet the criteria of efficiency and viability both for raising internal resources and for external borrowing. While the Central Public Sector tariff is not unrelated to cost there is the serious problem of security of payment on the part of State Power Utilities. Thus, the most formidable aspect of this vital sector revolves round the fact that the conversion of potential resources into actual capacities ultimately depend on the financial. factor.

THE STORY OF PRIVATE POWER

12. This is how the stage has been set for the evolution of private power policy. The initial, tentative thinking commenced as early as 1987, but it was only in mid 1991, that private sector power development was clearly recognized as a critical solution which is both sector specific and part of the larger economic reforms. The policy to encourage the private enterprise participation in the power sector is an invitation to both Indian and foreign companies to put up generation and distribution projects. In addition, there is also an emerging role in the area of renovation, modernization and managerial upgradation of existing plants.

13. The story so far regarding the private power initiative may be outlined with a few broad brush strokes:

- In August-September, 1991 the Electricity Laws were amended and a more congenial, legal, administrative and financial framework was put in place.

- A high level delegation headed by the then Cabinet Secretary and comprising the then Secretaries of Power, Finance and some representatives of Private Power Companies visited USA/UK in May-June, 1992 and made presentations at several major cities.

- In March, 1992 an attractive two-part tariff structure was announced through a Notification which allowed recovery of fullfixed charges with 16% return on equity at 68.5% plant load factor.

- Amendments were introduced in January and August, 1994 with a view to resolving several issues raised by the developers and also providing flexibility to the State Electricity Boards in negotiating Power Purchase Agreements (PPAs). More particularly, these amendments enable the capping of the incentive rate of return, providing flexibility in O&M and insurance charges, protection of return on foreign equity up to 16% from foreign exchange fluctuations and enabling the finalization of PPA in deviation of tariffs announced subject to certain conditions.

- In January, 1995 a revised hydro tariff Notification was also issued providing more attractive terms for hydroelectric power projects taking note of the special characteristics and risks associated with such projects.

- Initially, the MOU route proved more popular. It is understood that, as on date, interest has been expressed (including projects through MOU) for setting up 213 power projects for a total capacity addition of 92,954 MW, 52 of' these proposals involving foreign private investment, out of which 16 have been cleared from foreign investment angle.

- Further scrutiny of the proposals indicates that 16 of them involving 9895 MW could qualify for the first batch of fast track projects. Another 31 involving 22,744 MW could become candidates for speedier follow up in coming months, trailed by 43 more (18536 MW) in the pipeline.

- It is significant that after a slightly slow start many of the top Indian industrial houses who can borrow on the strength of their balance-sheets are stepping into this sector.

- In January, 1994 Government decided to extend GOI counter guarantee to 8 fast track projects, purely as a transitional, measure. The Government its now working on the evolution of alternatives to GOI counter guarantee. In, May, 1995 State Governments were advised to consider:

  (a) Direct supply of power by IPPs to NT consumers.

  (b) Opening of Escrow account in which identified payments by consumers are credited and the payment liability to the IPP is a first charge of this account.

  (c) Linking power generation with distribution.

- Government of India is also working on other alternatives like World Bank guarantee and Escrow arrangements with Central devolution also committed to such an account backed by State Government guarantee.

- State Electricity Boards are being strengthened in terms of technical and financial skills to grapple with the complex process of negotiations through the medium of workshops and training programmers. Standard guidelines for PPAs have also been circulated.

- Guideline.s for private investment in renovation and modernization and also for transmission projects are being evolved with expert assistance.

- Competitive bidding has been made mandatory since February, 1995 and guidelines have been issued for the purpose.

14. It would be far from the truth to create an impression that all or most of the expressions of interest would transform themselves into realities in a short span of time. The pre requisites for the success of the private sector power are many and include:

(1) economic tariff.

(2) securitization of payments.

(3) capabilities for negotiating PPAs.

(4) structuring competitive bidding.

(5) firming up bankable fuel supply agreements.

(6) overcoming constraints in external commercial. borrowing/domestic capital market.

And all these have to judiciously harmonize the multiple objectives of risk allocation incentivization and consumer protection.

THE TARIFF PROBLEM

15. All these revolve around the contentious issue of electricity pricing. According to available information, All-SEB average tariff per unit sold was 133 paise in 1994-95 as against cost per unit of 160 paise. "Domestic" and "agricultural" segments together account for about 48% of electricity sales at present. The All-SEB average tariff for agricultural consumers was 18.2 paise in 1993-94 marking a subsidy component of 87.4%. For the same year, the average rate charged to domestic consumers was 83.5 paise involving a subsidy component of 42%. The uneconomic pricing of electricity .is undoubtedly at the root of the chronic ailments dogging the Indian power sector. Which in turn, is inextricably linked with structural reform.

ON-GOING CHANGES

16.1 When one looks at the "On-going changes" the writing on the wall is clear. Whatever is sought to be done towards the achievement: of desired objectives in the power sector depends critically on the degree of success achieved i.n the reform and restructuring of the Indian power industry towards higher levels of technical efficiency, managerial competence and commercial viability. While this process commenced in a tentative manner with the covenants of the newly established Power Finance Corporation, it gained momentum through an All-India lower Ministers' Conference in 1992, acquired focus through a Workshop organized in October, 1993 in Jaipur with the participation of the multilateral agencies and finally led to the constitution of the High Powered Sub-Committee of the National Development Council. The recommendations of the Sub-Committee are considered to be hard headed and pragmatic and, when endorsed by the highest developmental forum of the country, would generate the national consensus so necessary for such far reaching endeavors.

16.2 Meanwhile, with the assistance of multilateral agencies like World Bank and ADB, a number of States have agreed to go on the reform path - more specifically Orissa, Haryana, Uttar Pradesh, Bihar, Rajasthan and Andhra Pradesh.

THE ORISSA EXPERIMENT

16.3 There can be no better curtain raiser than what has been initiated in Orissa. The international consultants for Orissa recommended separating generation, transmission and distribution and the establishment of an independent, transparent regulatory regime in order to promote efficiency and accountability in the operation of the system. The report was endorsed and the Reform Bill has since been passed by the State Legislatures and accorded Presidential Assent as required under the Constitution. New Corporations have been formed viz. Orissa Hydro Power Corporation and Grid Co. Arrangement for privatization of distribution in one territory is being finalized with the Bombay Suburban Electricity Supply Co. (BSES) on management contract basis. The tariff revision involving 20% increase has been effected. All said, there is considerable evidence of motivation and commitment to go ahead with these path breaking reforms.

THE ROAD AHEAD

16.4 Similar initiatives are at different stages of progress in Haryana, Rajasthan, Uttar Pradesh, Andhra Pradesh and Bihar. But it needs to be recognized that it would not be prudent to prescribe a rigidly set, uniform pattern at the State level. It is entirely conceivable that the vast and diverse nature of the Indian economy would warrant some variations in the broad model while aiming at:

- Distancing of Government from management and operation and t:he evolution of an independent regulatory mechanism; and

- Commercial and corporate reforms to place the sector on a clearly business basis and the involvement of the private sector in diverse aspects of power generation and distribution.

2.
CONCLUSION

17. Undoubtedly, sweeping changes have occurred in the Indian economy in general and the power sector in particular - since EMCAT was originally conceived and framed. Many problems have come into sharper focus. Equally many solutions have emerged on the horizon, Against this backdrop, EMCAT needs to be forward looking as a strategic, and not: spread-thin, intervention. Ideally, i.t should concentrate on some aspects of reform which have maximum multiplier effect, evolve specifically ground-level models capable of replication and help build up a nucleus of expertise aimed to strengthen the process of reform on a sound and sustainable basis.

ANNEXURE-I

Average cost of supply and average realization of State Electricity Boards for the year ending 31st March, 1994.

S1 No.	Name of the SEBs		Average cost of supply	Average Realization from all categories	Gap between Avg, cost of supply and Avg. realization from all categories
1.	2.		3.	4.	5.
			----------Paise/Kwh----------		
1.	A.P.	A	114.10	99.58	14.52
2.	Bihar	U	203.37	151.75	51.62
3.	Gujarat	U	158.82	143.63	15.19
4.	Haryana	A	162.32	92.00	70.32
5.	H.P.	A	116.11	99.96	16.15
6.	Karnataka	A	118.78	111.10	7.68
7.	Kerala	U	100.76	89.43	11.33
8.	M.P.	U	159.45	138.72	20.73
9.	Maharashtra	A	157.08	155.99	1.09
10.	Orissa	A	132.95	103.65	29.30
11.	Punjab	A	149.20	98.48	50.72
12.	Rajasthan	A	176.84	128.02	48.82

13.	Tamil Nadu	A	156.31	129.27	27.04
14.	Uttar Pr.	U	189.55	116.80	72.75
15.	W.B.	U	174.79	139.46	35.33
16.	Assam	P	351.81	127.36	224.45
17.	Meghalaya	P	114.43	92.12	22.31
	Total		153.22	125.32	27.90

A - Audited
U - Unaudited
P - Provisional

ANNEXURE-II

Statement showing the Date of last revision of tariff by the SEBs.

S1 No.	Name of the SEBs	Date of last revision of tariff
1.	A.P.	1.12.92
2.	Bihar	1.7.93
3.	Gujarat	21.5.93
4.	Haryana	1.4.95
5.	H.P.	1.6.94
6.	Karnataka	1.8.93
7.	Kerala	1.10.94
8.	M.P.	July, 1995
9.	Maharashtra	1.5.94
10.	Orissa	5.11.1995
11.	Punjab	25.10.94
12.	Rajasthan	1.5.93
13.	Tamil Nadu	1.3.94
14.	Uttar Pr.	16.7.94
15.	W.B.	7.1.95

16.	Assam	8.9.94
17.	Meghalaya	August, 1992

ANNEXURE-III

Statement showing yearly profit/loss of the State Electricity Boards after taking into account RE subsidy as provided in the Accounts.

(Rs. in crores)

S1 No.	Name of the SEB	1991-92	1992-93	1993-94 (*)
1.	Andhra Pradesh	84.44	79.45	86.90
2.	Bihar	-113.72	191.19	442.65
3.	Gujarat	69.49	89.29	92.26
4.	Haryana	-206.84	-335.67	-410.90
5.	Himachal Pradesh	2.72	11.82	14.61
6.	Karnataka	24.30	32.20	33.87
7.	Kerala	-35.86	18.42	24.12
8.	Madhya Pradesh	83.71	101.01	118.24
9.	Maharashtra	125.19	272.00	288.90
10.	Orissa	24.74	23.49	29.98
11.	Punjab	4.70	-118.53	-117.90
12.	Rajasthan	61.84	65.04	70.12
13.	Tamil Nadu	84.38	224.10	255.54
14.	Uttar Pradesh	67.09	213.86	71.87
15.	West Bengal	-92.22	-28.35	17.81

16.	Assam	-225.49	-70.68	-264.60
17.	Meghalaya	8.80	-5.96	-5.97
		-32.73	763.68	717.59

(*) Provisional/Unaudited

ANNEXURE-IV

Statement showing yearly profit/loss of the State Electricity Boards after taking into account RE subsidy as provided in the Accounts.

(Rs. in crores)

S1 No.	Name of the SEB	1991-92	1992-93	1993-94 (*)
1.	Andhra Pradesh	14.88	79.37	86.86
2.	Bihar	-294.31	-242.41	280.65
3.	Gujarat	-607.19	-537.93	-492.35
4.	Haryana	-246.87	-370.90	-482.68
5.	Himachal Pradesh	2.71	11.82	14.61
6.	Karnataka	-64.90	-19.49	-1.89
7.	Kerala	-37.43	18.40	24.12
8.	Madhya Pradesh	-180.23	-279.04	-297.01
9.	Maharashtra	-74.31	272.00	288.89
10.	Orissa	4.16	23.49	-196.05
11.	Punjab	-266.60	-460.73	-499.35
12.	Rajasthan	-100.99	-221.43	-354.82
13.	Tamil Nadu	-127.34	-231.96	-301.56
14.	Uttar Pradesh	-720.25	-691.46	-1090.20
15.	West Bengal	-148.79	-96.42	-55.38

16.	Assam	-291.34	-134.75	-329.60
17.	Meghalaya	2.80	-12.46	-12.97
		-3136.00	-2893.90	-3418.74

(*) Provisional/Unaudited

APPENDIX 7 SUPPLY SIDE ASSISTANCE ACTIVITIES

BECHTEL EMCAT SUPPORT PROJECT
TRAINING

No.	Subject	Duration	No. of Trainees	
			PFC	SEB
TR#1	Financial Operations and Management	April 18- May 25, 1994	19 (3 + 16)	
TR#2	Information Technology and Management Information Systems	Sept. 6- Oct. 21, 1994	20 (3 + 17)	
TR#3	Renovation and Modernization of Trans. Lines and Sub-stations	July 25 - Aug. 31, 1994	20 (3 + 17)	
TR#6	Improvement of Urban Distribution System	March 7- April 13, 1995	25 (4 + 21)	
TR#8	Financial Operations and Management	Jan. 16 - Feb. 16, 1995	20 (3 + 17)	
TR#9	Techniques of Financial & Economic Appraisal and Monitoring of Power Projects	May 30 - June 30, 1995	21 (3 + 18)	
TR#10	Environmental Impact Assessment and Mitigation	Nov. 7 - Dec. 15, 1994	20 (1 + 19)	
TR#11	Strategic Planning and Management	Sept. 28 - Oct. 25,1995	10 (2 + 8)	

TR#12	Electric Utility Costing and Pricing & Utility Rate Design	Feb. 7 - Mar. 1, 1996	20 (2 + 18)
TR#13	Planning and Design of cost effective strengthening of existing T&D Systems	To be scheduled in 1996-97 after MTE	
TR#14	Power Pooling, Co-ordination, Energy, Accounting and Billing, etc.	To be scheduled in 1996-97 after MTE	

BECHTEL EMCAT SUPPORT PROJECT
TECHNICAL ASSISTANCE

No.	Subject	Status
TA#1	OFAP Manual	Revised Manual submitted. Work completed.
TA#2	Project Appraisal Manual	Additional effort required in order to bring the consultation with PFC.
TA#3	Investment Planning Manual	- do -
TA#4	PFC Library Improvement Program	Tasks I&II completed. Consultant visited India for Task III in August 1995. Trip report submitted.
TA#5	T&D Loss Reduction Workshop	Workshop held in January 1994. Recommendations submitted.
TA#6	Organisation Study of PFC	Work completed & recommendations implemented.
TA#8	Financial Operations Management & Reporting (Workshop)	Held in December 1995.
TA#9	Operation Efficiency Improvement of Thermal Power Plants	Work commenced. Put on Hold on the advice of USAID till MTE.
TA#10	Computerization of Utility Management Functions (Workshop)	On Hold on advice of USAID.
TA#14	Development of Design Construction Standards for Urban Distribution Systems	- do -

TA#20	Training program on Power System Economics and Private Power Development	- do -

BECHTEL EMCAT SUPPORT PROJECT
STUDY TOURS

NO.	PARTICIPANTS	DATES
ST#1	M.P. Chawla, Chairman, MPSEB H.S. Brahma, Member Secretary,APSEB A.A. Khan, Director(IDA),PFC Rajib Ranjan, DGM(EMCAT)	December 8 to 18, 1993
ST#2	I.M. Sahai, CMD, PFC K.V. Irniraya, Chairman, KEB B.B. Tandon, Chairman, HPSEB Jitesh Khosla, Director, DEA	July 17-27, 1994
ST#3	K K. Govil, Director(P), PFC A. P. Muthuswamy, Chairman, TNEB Brijeshwar Singh, Accounts Member,TNEB S.S. Poddar, Accounts Member, MSEB K.H. Fadia, Chief Engineer, GEB P.S.S. Thomas, Managing Director,KPC	Jan. 28 to Feb. 10, 1995
ST#4	On hold on the advice of USAID until MTE	

BECHTEL EMCAT SUPPORT PROJECT
COMMODITY SUPPLIES

ITEM	COST	REMARKS
Oracle Software	$117,905	Oracle RDBMS software Supplied through Indian agents on October 10, 1995.
Hardware/Software (Note books, Servers and Desktops)	$ 79,020	Supplied through Micro City, U.S.A. in September 1995.
21 Color Monitors	$ 7,450	Supplied through Micro City, U.S.A. in November, 1995
Total Cost	$204,375	

ANNEXURE - II

DETAILS OF TRAINING PROGRAMMES IN INDIA

1992-93

In-company Programmes :

S1. No.	Programme	Institute	Date	Participants	
				PFC	SEBs
1.	Finance for Non-Finance Executives	MDI Gurgaon	20-24 July 1992	19	-
2.	Computer Appreciation for Top Executives	IISCT Delhi	23-24 Aug 1992	19	03
3.	Financial Management in Power Sector	MDI Gurgaon	19-23 Oct 1992	05	09
4.	Increasing Effectiveness (Under Management Efficiency Improvement	DMA Delhi	03-14 July 1992	25	-
Individual Nominations (only PFC)					
1.	Individual Nominations to various Executive Development Programmes	Institutes of repute Conducting Training in India.		35	-

1993-94

In-company Programmes:

S1. No.	Programme	Institute	Date	Participants	
				PFC	SEBs
1.	Unix & Unix related Software	NIIT, Delhi	July 93	04	12
2.	Computer Orientation Programme for Senior Officers	Digital, Delhi	August 93	11	01
3.	Finance for Non-Finance Executives	MDI, Gurgaon	Sept-Oct 1993	11	05
4.	Manpower Planning & HRM in Power Sector	IAMR, Delhi	Oct 93	05	09
5.	Financial Management in Power Sector	MDI, Gurgaon	Nov 93	06	12
6.	Increasing Effectiveness (Under Management Efficiency Improvement Programme)	ISTM, Delhi	Nov 93	15	-
Individual Nominations:					
1.	Individual Nominations to Training Centres	Institutes of repute conducting Training in Indian	49	-	

S1. No.	Programme	Institute	Date	Participants	
				PFC	SEBs
1.	Financial Operations	ICWA	11-15 Apr 1994	03	17
2.	Commercial Accounting	IFMR, Madras	08-13 Aug 1994	-	20
3.	Enhancing Effectiveness	IIPA, New Delhi	18-20 Aug 1994	05	11
4.	MIS	TATA UNI SYS, Delhi	30 Aug-03 Sept 1994	03	18
5.	Commercial Accounting	MDI, Gurgaon	12-16 Sep 1994	01	22
6.	Commercial Accounting	IFMR, Madras	03-08 Oct 1994	-	22
7.	Private Power Development	GE, USA (Visiting Faculty in India)	17 Oct - 18 Nov 1994	07	18
8.	Environmental Aspects	NPTI, Faridabad	24-28 Oct 1994	02	19
9.	Commercial Accounting	MDI, Gurgaon	07-11 Nov 1994	01	14
10.	Commercial Accounting	IFMR, Madras	13-18 Nov 1994	-	20
11.	HRD in the Power Sector	IIM, Ahmedabad	23-27 Nov 1994	03	24
12.	Financial Operations and Management	ICWA, Delhi	02-06 Jan 1995	03	24

13.	Financial Accounting and Management	MDI, Gurgaon	23-27 Jan 1995	03	17
14.	Electric Utility and Management	IIM, Bangalore	13-17 Feb 1995	01	19
15.	State-of-the-Art Techniques for Load Management and Efficiency Improvement of Urban Distribution System	ESCI, Hyderabad	20-24 Feb 1995	04	22
16.	Renovation and Uprating of Hydro Power Plants	AHEC Roorkee	6-11 Mar 1995	-	10
17.	Human Resource Plg. and Management	IAMR Delhi	24-28 Mar 1995	3	20

Individual Nominations:

1.	Individual Nominations to Training Centres	Institutes of repute conducting training in India.		25	-

1995-96

In-company training Programmes

S1. No.	Programme	Institute	Date	Participants PFC	SEBs	
1.	Economic and Financial assessment and Monitoring of Power Projects.	PMI NTPC Noida	15-19 May 1995	03	20	
2.	Financial Mgt. & commercial accounting and Project Monitoring	NPTI Neyveli	3-14 July 1995	00	17	
3.	O&M of Sub-Station and O&M of Hydro Power Plant	NPTI Neyveli	17-30 July 1995	00	22	
4.	Energy audit and HT metering	NPTI Neyveli	31 July-11 Aug. 1995	00	18	
5.	Strategic Planning and Management	ASCI Hyderabad	28 Aug.-1 Sept. 1995	06	12	
6.	Inventory Management	IFMR Madras	18-22 Sept. 95		01	23
7.	Financial Model for Evaluation of PPAs	PFC	28-29 Sept.95	07	09	
8.	Executive Development	IIM Bangalore	13-17 Nov. 95		02	24

Individual Nominations

1.	Individual Nominations to training centres	Institutions of repute conducting training.	80

Attachment

TRAINING PROGRAMMES EFFECTIVENESS AND RESPONSE (INDIAN)

1992-93

S1. No.	Programme	Institute	Overall Rating	Training Applicable to work situation
1.	Finance for Non-Finance Executives	MDI Gurgaon	80.70	68.61
2.	Computer Appreciation for Top Executives	IISCT Delhi	76.87	67.33
3	Financial Management in power sector	MDI Gurgaon	78.67	69.71
4.	Increasing Effective -ness (Under Manage-ment Efficiency Improvement Programme)	DMA Delhi	73.93	63.68

1993-94

S1. No.	Programme	Institute	Overall Rating	Training Applicable to work situation
1.	Unix & Unix related Software	NIIT, Delhi	74.24	84.69
2.	Computer Orientation	Digital		

	Programme for Senior Officers				
3.	Finance for Non-Finance Executives		MDI, Gurgaon	79.52	68.21
4.	Manpower Planning & HRM in Power Sector		IAMR, Delhi	80.19	76.54
5.	Financial Management in Power Sector		MDI, Gurgaon	84.61	79.17
6.	Increasing Effective-ness (Under Management Efficiency Improvement Programme)	ISTM,	Delhi		

1994-95

S1. No.	Programme	Institute	Overall Rating	Training Applicable to work situation
1.	Financial Operations	ICWA	83.92	75.00
2.	Commercial Accounting	IFMR Madras	87.00	84.41
3.	Enhancing Effectiveness	IIPA, New Delhi	81.11	78.13
4.	MIS	TATA UNI SYS, Delhi	79.73	84.50
5.	Commercial Accounting	MDI, Gurgaon		
6.	Commercial Accounting	IFMR, Madras		
7.	Private Power Develop-ment	GE, USA (Visiting Faculty in India)	75.76	69.80
8.	Environmental Aspects	NPTI, Faridabad		
9.	Commercial Accounting	MDI, Gurgaon		
10.	Commercial Accounting	IFMR, Madras		
11.	HRD in the Power Sector	IIM, Ahmedabad	85.38	77.22
12.	Financial Operations and Management	ICWA, Delhi		

13.	Financial Accounting and Management	MDI, Gurgaon	88.50		90.50	
14.	Electric Utility and Management	IIM, Bangalore		85.66		81.50
15.	State-of-the-Art Techniques for Load Management and Efficiency Improvement of Urban Distribution System	ESCI, Hyderabad		74.63		75.38
16.	Renovation and Uprating of Hydro Power Plants	AHEC Roorkee		85.12		
17.	Human Resource Plg. and management	IAMR Delhi	82.58		77.27	

1995-96

S1. No.	Programme	Institute	Overall Rating	Training Applicable to work situation
1.	Economic and Financial assessment and Monitoring of Power Projects.	PMI NTPC Noida	80.35	77.14
2.	Financial Mgt. & commercial accounting and Project Monitoring	NPTI Neyvelli	77.75	62.35
3.	O&M of Sub-Station and O&M of Hydro Power Plant	NPTI Neyvelli	77.84	71.82
4.	Energy audit and HT metering	NPTI Neyvelli	81.45	70.56
5.	Strategic Planning and Management	ASCI Hyderabad		
6.	Inventory Management	IFMR, Madras		
7.	Financial Model for Evaluation of PPAs	PFC, NEW DELHI		
8.	Executive Development programme	IIM, Bangalore	85.91	81.88

WORKSHOPS

S1. No	Topic	Location	Dates
01.	Metering, Billing & Collection Phase-I	New Delhi	Feb 5-6, 1993
02.	Metering, Billing & Collection Phase-II	New Delhi	Jul 9-11, 1993
03.	Curbing Theft of Energy	New Delhi	Jan 20, 1994
04.	System Improvement Leading to Reduction in T&D Losses	New Delhi	Jan 21-22, 1991
05.	Capacitor Installation Programme	New Delhi	April 15, 1994
06.	Improvements in Power Sector in North Eastern States	Shillong	June 2-3, 1994
07.	Power Utilities Efficiency Improvement	New Delhi	June 13, 1994
08.	-- do --	Calcutta	June 16-17, 1994
09.	-- do --	Bombay	June 21-22, 1994
10.	-- do --	Madras	June 24-25, 1994
11.	Hydro Power Development	Shimla	Nov 10-11, 1994
12.	Review of T&D losses in Power Sector	New Delhi	April 8, 1995
13.	Review: Indigenous Electronic Meters their Conformance to Applicable Standards and Pilfer Proofing in Meters.	New Delhi	May 26, 1995
14.	Review: Capacitor Installation Programme.	New Delhi	May 26, 1995
15.	Review: Power Sector Improvements	Shillong	June 6-7, 1995

	in North Eastern States.		
16.	Review of project management & Methodology for execution of projects in State Power Sector	Baroda	28 Aug. 1995
17.	Efficiency of Thermal Power Stations	New Delhi	16 Oct. 1995
18.	Operations & Maintenance of T&D Systems	Hyderabad	20-21 Oct. 1995
19.	Meeting with Chief Executives of Power Utilities	New Delhi	30 Oct. 1995
20.	Financial Operations, Management & Reporting	New Delhi	8-9 Dec. 1995

TECHNICAL ASSISTANCE THROUGH INDIAN EXPERTS

1. Organisation Study of PFC by M/s ID Associates.

2. Study of Indigenous Meter Technology for possible improvements.

3. Computerisation in Power Finance Corporation by M/s CMC Limited.

4. Post Commissioning evaluation of benefits for HT Capacitor Installation Programme by Shri K.C. Mahapatra, Ex-Chairman, OSEB.

5. Rationalisation of pay and perquisites by Shri Krishna Chandra.

6. Past trends in costs to evolve system of cost estimation for power projects and projection of costs and benefits for schemes (to be undertaken).

7. Role analysis exercise for Effective Performance Planning, Review Analysis and Feedback System in SEBs (to be undertaken).

8. Formulation of tariffs/incremental tariffs for the utilities for different supply segments (i.e. Generation/Transmission/Distribution) and for different segments of consumers (to be undertaken).

9. Develop a strategy for Demand-Side Management with emphasis on variable operating conditions e.g. during peak seasons (Agriculture, Seasonal Industrial production, Air-conditioning, etc.) (to be undertaken).

10. Computer based system studies for elemental portions of Transmission and Distribution system for better planning (to be undertaken).

11. Development of common/uniform Data base for Information Flow from SEBs to PFC (to be undertaken).

TA THROUGH INDIAN EXPERTS (PERSON WEEKS DETAILS)

S1. No.	Name of the Consultant	Purpose	Duration	Remuneration P.M.
1.	Sh. Krishna Chandra	Rational-isation of pay & perks	3 Months w.e.f Aug,95	Rs. 19500 Consolidated
2.	Sh. A.K. Agarwal	Financial Operations Management & reporting work-shop	3 Months Oct-Dec 95	Rs. 8000/-P.M.
3.	Sh. P.D. Sharma	Operation & Maintenance of Sub-Stations and transmission lines workshop	3 Months	Rs. 7000 P.M.
4.	Sh. Krishna Swarup	Review of T&D Losses in Power sector workshop	3 Months	Rs. 8000 P.M.
5.	Sh. S.C. Mehta	Jr.Consultant	March 92 March 95	Rs. 4800 P.M.
6.	Sh. K.C. Mohapatra	Evaluation of capacitor Installation Programme	Nov 94 - Jan 95	Rs. 7000 P.M.
7.	M/s CMC Ltd.	Computeri-sation in Power Finance Corp. Ltd.	Oct/Nov 93 till Date	Rs. 205100

8.	Sh. H.C. Tandon	Power Utility Efficiency Improvement	21.4.94 to 30.6.94	Rs. 7000 P.M.
9.	Sh. K.P. Ray	Improvements in Power Sector in NE states	May-June 94	only TA/DA
10.	Sh. A.P. Das	Do	Do	Do
11.	Sh. L.M. Puri	Do	Two Months	Rs. 7500 P.M.
12.	M/s W.S. Taube	Seminar on Private Power Development		Rs. 20000/P.M.
13.	M/s I.D. Associates	Organisation Structure Study of PFC	App.4 Months	Rs. 282000/P.M.
14.	Sh. Krishna Swarup	OFAP	17 May 93 -Nov 94	Rs. 7000
15.	Sh. J.N. Kataki	Review; Power sector improvements in NE States	One Month	Only TA/DA
16.	Sh. A. Bhattacharjee	-Do-	One Month	-Do-
17.	Sh. J.V. Sastri	T&D Loss Workshop	3 Months 15 Days	Rs. 6500/-
18.	Sh. K. Bhaskara Rao	-Do	10.11.93 to 31.1.94	Only TA/DA
19.	Sh. N.K. Banerjee	-Do-	-Do-	-Do-

APPENDIX 8 IDBI's COMMENTS

EMCAT Mid Term Evaluation - Draft Report

EMCAT End-use Efficiency Component

Sl.No.	Para No.	Page No.	Particulars	IDBI's Comments
1.	C1	10	EMCAT DSM programme is very effective. Effectiveness of this programme is substantially due to the close follow-up by RMA..	We agree with the comment.
2.	C2	11	LPD related activity has produced a large number of studies but has been ineffective in leading to bankable projects. For LPD activity to be successful, a more aggresive and comprehensive strategy is needed to facilitate energy efficiency investment. IDBI efficiency lending is a mismatch with the scale and flexibility needed to assist small and medium sized firms IDBI's normal large scale conventional lending appear to retard such utilisation. To be effective, IDBI will need to develop complementary inputs.	IDBI is engaged in financing projects only in medium and large scale sector. No technical assistance provided since the same is expected to be obtained from consultants. The same applies to complementary inputs. IDBI exercise considerable flexibility in structuring financial assistance. Even a concessional rate of interest of rupee loan is considered.

3.	C3 & G5	12 & 16	The projects ESCO support efforts have been very effective in stimulating interest and facilitating the formation of ESCOs But barriers do exist.	We agree with the observation. It is, however, expected that the new ESCO entrants would stimulate ESCO activity.
4.	C4	12	Evatuation findings indicate that by far the most attractive near-term market for ESCO-type services or investment appears to be providing reliable electricity supply, either stand-alone or through cogeneration, for small and medium sized industrial firms.	We agree with the observation.

Sl.No.	Para No.	Page No.	Particulars	IDBI's Comments
5.	C5	13	Energy Audit training is not as effective as it could be because of basic courses.	The observation appears reasonable.
6.	D1	13	EMCAT DSM efforts are primarily being implemented in a pilot project with AEC, and directly have potential for significant impact for that utility.	We agree with the observation.
7.	D2, D3, D4	14	LPD impact to date is uncertain, but probably very small, and is not likely to improve without significant redirection. While contributing to ESCO formation and interest, there has not had much of an impact by ESCO's in energy efficiency investments. It was infesible to judge the impact of basic energy audit training due to the short-time since this training occurred.	We agree with the observation.

8.	E1 to E5	14-15	**Efficiency:** Efforts on LPD could have been much more cost-effective and their technical and financial depth improved, if there had been a much higher proportion of local consulting engineering input.	We agree with the observation.
9.	F1	15	The DSM activity will be sustained at AEC but the possibilities for replication at other utilities is limited at this time.	We agree with the observation.

S1 No.	Para No.	Page No.	Particulars	IDBI's Comments
10.	F2 & G4	15 & 16	As curently implemented, the LPD activity is not sustainable. EMCAT's LPD activities are not now significantly contributing to bankable projects for the loan.	The LPD aims at studing 15 energy intensive sectors. As per the terms of RMA contract, RMA is expected to also do financial analysis for the energy conservation (ECO) projects identified under LPD. It is expected that after the identification and implementation of ECO projects, the LPD activity would become sustainable, given the attractive pay back periods of ECO projects. The LPD studies on the sectors covered so far does not include required financial analysis. However, some of the units (viz. GNFC, Seshasayee papers and Shri Cement) have indicated plans for setting up of ECO projects. The feed-back when fully received and compiled would indicate the efficacy of LPD activity completed so far. It is felt that the LPD reports should contain required financial analysis. Such a report would enable the enterprises to make investment decisions quickly and enhance efficacy of the programme.

11.	F3	15	Support for ESCO's in energy efficiency, coupled with power supply, still appears to be a sound strategy for achieving a sustainable private sector efficiency investment.	We agree with the observation.
12.	F4	15	The current energy auditing programme is not sustainable.	We agree with the observation.

S1 No.	Para No.	Page No.	Particulars	IDBI's Comments
13.	G7	16	Engery audit skills can beneficially be improved through training in India, and expanded efforts are worthwhile. However, EMCAT activities, particularly basic audit training, while undoubtedly of general educational value, did little to contribute directly to achieving energy savings and creating improved local efficiency analysis capability.	The observation appears reasonable.

Evaluation Team Recommendations and Our Commenst:

S1 No.	Para No.	Page No.	Particulars	IDBI's Comments
1.	I1	17	The EMCAT DSM programme should give greater attention to DSM options with large-scale potential for peak demand reduction or conservation such as energy efficient lighting systems. Technical and dissemination uncertainties in such areas should be addressed as priorities.	We agree.

2.	I2	17	Due to the critical importance of innovative financing and promotional efforts in achieving DSM changes, EMCAT should give more emphasis to developing practical and effective financing and promotional schemes such as utility and third-party financing and installation.	We agree.
3.	I3	17	EMCAT demonstrated DSM improvements should be used to help promote utility distribution reforms in SEB's.	We agree.

S1 No.	Para No.	Page No.	Particulars	IDBI'S Comments
4.	I4	17	In general, utility partnerships between U.S. electric utilities and Indian counterparts, should be used as way to spread sound DSM and efficiency programmes. These should be integrated with support to improve billing and collection, T&D loss reduction, power plant rehabilitation and maintenance.	We agree.
5.	I5	17	Additional LPD studies currently planned should be reoriented, redesigned and rebudgeted to strongly support the process of producing a bankable project.	Information on energy intensity in the Indian industry is available. It is felt that the present format of LPD study should be retained with modificantions viz. (i) The activity should be supported with more local consultant input; (ii) Detailed financial analysis should form a part of LPD reports so that the enterprise can make quick investment decision for ECO projects.

6.	I6	18	LPD studies should only be performed where they are part of a clear strategy to achieve both specific projects, as well as fit into a sectoral plan to stimulate similar action. All studies should be personally presented to senior company management by RMA consultants, plus local consultants and IDBI.	The LPD studies do aim at achieving specific projects. Presentation of LPD studies by RMA would be very useful.
7.	I7	18	On a sector by sector basis, workshops should be organizeds to share the results of LPD studies and any similar or resulting investments, as well as to instruct on preparation of document adequate to receive IDBI feasibility study financing.	We agree.

S1 No.	Para No.	Page No.	Particulars	IDBI's Comments
8.	I8	18	IDBI should consider establishing or spinning-off a "profit center" or venture capital entity whose goal is to invest in energy efficiency, cogeneration and/or small scale captive or grid integrated independent power projects. IDBI should consider supporting cost-shared feasibility studies and creation of a revolving fund for this purpose.	The existing schemes of IDBI would suffice for this purpose. No viable project would languish for want of financial assistance. It may not be, therefore, necessary to create a revolving/separate fund for this purpose.
9.	I9	18	EMCAT ESCO support should continue with limited ESCO promotion...	We agree.
10.	I10	18	EMCAT should provide additional technical and policy support to ESCOs. This should stress electrical power supply opportunities.	We agree.
11.	I11	18	EMCAT should work with IDBI at attempt to define innovative financing and financial incentive mechanisms to assist in promoting ESCOs, e.g. financial support to buy-down interest rate on initial ESCO projects, IDBI equity investment etc.	IDBI would consider financing ESCOs on merits. However, incentives such as concessional rate of interest are not possible.

12.	I12	18	Technical education supported by EMCAT should not be limited to engineers...	We agree.
13.	I13	18	Energy audit support should be directed toward supporting and promoting development of improved or expanded local efficiency training...	We agree.

S1 No.	Para No.	Page No.	Particulars	IDBI's Comments
14.	I14	18	Support for development of a certification program for auditors would also be a desirable goal to upgrade the quality of audit work done, as well as to stimulate interest in this area as professional development opportunity.	The support may be considered by EMCAT against specific proposals.
15.	I15	18	EMCAT needs to institute follow-up sample surveys of trainees and energy audit firms to evaluate and document any impacts, as well as the sustainability of training and equipment purchases.	We agree.
16.	I16	18	The current contract with RMA should be extended until March 1999 and an additional $1 million in funding provided.	We agree.
17.	5.1	37	It is recommended that the project be extended to December 31, 1999.	Since IDBI has been involved with EMCAT project since 1991, we should continue to be associated with the project till its logical conclusion. As such, we agree to the proposed extension of the project duration.

18.	5.6	37	A representative of ASCI should become a member of the Project Review Committees.	The matter may be discussed with USAID.

APPENDIX 9 PFC COMMENTS

DRAFT FINAL REPORT

MID-TERM EVALUATION TEAM

ON

ENERGY MANAGEMENT CONSULTATION

AND TRAINING (EMCAT) PROJECT

POWER FINANCE CORPORATION LIMITED

36, JANPATH, NEW DELHI - 110 001

REPORT FINDINGS

SECTION 4: POWER SUPPLY COMPONENT

A. GENERAL FINDINGS

1. While the Indian power sector has made some impressive physical achievements in the past, the system is for the most part perceptions.

Many of the SEBs are characterized by large inefficiencies and financial insolvency in the strict sense. Unable to collect large arrears and to price power according to its costs, many of these SEBs are not able to maintain the system let alone increase it to meet the needs of a growing economy. On the one hand, they are unable to control revenues while, on the other, they also have little control over inputs and their associated costs such as fuel and personnel. This characterizes the conditions when the EMCAT project was designed and today. But there are differences between then and now;

- First, the Central Government was earlier willing to make development allocation to the States for capacity expansion. This is no longer true. Capacity expansions must come from either State or private sources;

- Second, private power is becoming an increasingly important player in India, whereas at the time of EMCAT design it was virtually
- nonexistent;

- Third, lenders are unwilling to provide the magnitude of funds to help SEBs meet their physical needs without some form of guarantee - either in the form of State guarantees or in the form of massive restructuring of the SEBs. Most states are often unwilling or unable to provide bankable guarantees leaving access to large amounts of capital controlled by the willingness to reform the sector; and, most important;

- Fourth, the shear magnitude of resources needed to meet the power sector's challenges are far greater today than when EMCAT was designed. This is due to several factors. The SEBs and the GOI have been unable to meet the capacity requirements even before massive economic growth began. Given the significant economic growth which has taken place the gap between demand and supply has widened. Finally, the system has further depreciated requiring far more resources that were needed five years ago.

PFC Comments: This is a general preamble according to the EMCAT Evaluation Team's unable to meet power needs under business as usual conditions.

2. PFC has made some solid contributions to the Indian Power Sector. But it is unrealistic to believe that it could have become a major lender at any individual SEB for some time.

Since 1988 PFC has sanctioned loans for more than $2.3 billion and disbursed more than $1.5 billion. PFC operations cover the full range of power activities from generation to distribution.
PFC's assets as of March 1995 stood at about $1.37 billion. The magnitude of the problems facing the power sector are far greater.

PFC Comments: PFC funding is only an additionality to plan funds.

It is estimated that in two SEBs alone external assistance will approach almost $ I billion. Even if PFC had expanded its size by six times, providing the amount of capital needed in these two SEBs would amount to almost 12% of PFC's total assets. This would indeed be a dangerous position.

Moreover, given the financial problems of most SEBs, taking a large position in any single SEB would have been too risky. This is not unlike the conditions which existed in the oil industry in the early mid 1980s. Many oil companies had vastly overvalued assets, were suffering large losses and could not control their revenues. No single bank could be expected or would have become a specialized lender at that time. To the contrary, banks were attempting to diversify away from the sector to reduce their risk. PFC can't diversify away from the electricity sector so it must fund other ways of spreading risk.

3. PFC's response to its own needs and to the changes in the Power Sector are to diversify.

The new Chairman has mapped out a plan in his "Vision 2000" which will bring PFC into a number of new areas, spread their risk by lending in new activities such as private power and increase the sources of funds. This is entirely understandable and should prove to make PFC a more viable financial institution. It will not necessarily increase its ability to be a catalyst for change at the SEBs.

PFC Comments: The perception of the evaluation team on PFC's ability to act as catalyst for change is not correct. PFC has been the only DFI exclusively devoted to the power sector. PFC's lending operations inter-linked with its developmental role has been a catalyst in fostering and expediting the desired changes in the state power sector as recognised by all including WB and ADB.

Details on PFC's contribution in bringing about quantitative and qualitative improvements in SEB's performance which were eligible for PFC funding were also given as a background material to the EMCAT evaluation team. PFC was expected to meet state power sector's requirement of funds over and above the plan allocation. Annual plan allocation funds account for 70-80% of State power sectors outlay in different years.

PFC assistance which is an additionality to plan funds has been, at the margin significant as well as critical, as is evident by the fact that disbursements constituted 8 to 15% of state power sector actual expenditure/ outlay in different years. This would mean that PFC is meeting about 40-50% of the gap between their requirement and plan allocations. This would increase substantially if power sector outlay in respect of State Utilities, which were not eligible for PFC assistance owing to conditionalities imposed under WB/ ADB line of credit, are excluded. PFC envisages a multifold growth in disbursement levels equivalent to 20% of the total state power sector investment requirement. This would further enhance PFC's ability to catalyse change in the state power sector consistent with GOI policy.

B. PROJECT OUTPUTS

The mandate of the EMCAT project is to support the goals of USAID/India Energy initiatives to improve the efficiency of both energy supply and its utilization in the industrial and other sectors. The Bechtel EMCAT Support Project (BESP) provides:

Technical Assistance (TA):	400 Person-Weeks (PW)
US Training (TR) :	1,500 PW
US Study Tours :	80 PW

The EMCAT project has supported various in-country training, workshops/seminars and studies on power sector related areas in addition to the work covered under BESP. The cumulative achievements to date of TA and TR are as follows:

BESP Technical Assistance	103.5 PW
Training in US	853 PW
Training in India	815 PW
In-Country Workshops	20
Studies Completed Through Indian Resources	5

PFC Comments: No comments

C. RELEVANCE

1. Project Objectives and Purpose Still Relevant: Inefficiency in electricity supply has not appreciably dropped and it still remains an important constraint to economic growth.

At the time of project design thermal plant load factors (PLF) at all SEBs averaged 54.6%. As of FY 94/95, this figure stood at only 55%. Both the all SEBs PLFs indicate fairly erratic behavior over this period and do not on average exhibit any strong upward trend. For example, all the SEB PLF in each of the years from FY 89/90 to FY 94/95 are, in chronological order, 54.6, 50, 47.8, 54, 56.6 and 55. Transmission and distribution losses for all SEBs have fallen from 22.9% in FY 89/90 to 21.5% in FY 93/94. However, the individual SEB performance is quite mixed over this period. This traditional measures of efficiency do not indicate that any sustainable gains have taken place. Perhaps a more revealing indicator is industry's perception of the government's ability to supply electricity reliably and efficiently. One such indicators the reliance on captive power which has grown from 8,100 MW to 10,100 MW by FY 93/94.4

The parameters like PLF improvement and reduction in T&D losses should not be seen in totality for the entire power sector, but only in respect of those states where PFC has provided appreciable funding support as per eligibility norms determined in agreement with WB/ADB.

2. The organizational assumptions are no longer valid.

The project design originally envisioned that PFC would be a catalyst for change by being "a major source of both financing and, through EMCAT, technical assistance/training/studies." This was assumed for a number of reasons. First the PFC had been recently established (l986) by the GOI as a development finance institution for the power sector. Second, the World Bank and ADB had committed over $500 million in capital to the PFC and would in the future channel power sector lending through state power utilities' requirements in addition to the plan funds is the PFC. Moreover, with appropriate leveraging of its equity, PFC could mobilize even greater financial resources for the power sector.

Therefore, PFC would be a major lender to the SEBs. Third as a direct result of PFC's anticipated premier role in financing SEB power projects, it was expected that it could have a major impact on improving sustainable financial and operational performance of SEBs. Thus, it was believed that PFC would be the most effective point for USAID's relatively small assistance.

PFC's position as a major source of power sector financing has failed to materialize. The World Bank and ADB have by-passed PFC and are now in the early stages of lending directly to several SEBs. Moreover, the OFAP conditionality for lending has proved to be a major constraint to funds mobilization.

PFC Comments: The evaluation team's observations that PFC's position as a major source of power sector financing is not understood and is not based on pattern of funding being followed for meeting state power sector outlay. As mentioned 70 to 80% of total state power sector outlay

is met by plan funds. PFC provides supplementary funds to bridge the gap in resource availability over and above the plan funds. As far as the concerned PFC's assistance has been about 40-50% of this amount as brought out above. PFC would continue to be the premier DFI for the state power sector utilities, over and above the plan funds as other Indian FIs are generally yet to take up the project financing requirements of such utilities. Moreover PFC's expertise and experience in, financing state power sector projects and dealing with problems of state power sector utilities positions the Corporation in strategically advantageous situation for lending as well as fostering desired changes in the state power sector functioning.

Similarly the team's contention that OFAP conditionality has been a constraint in mobilisation of funds is not correct. OFAP based lending has in fact helped SEBs in mobilisation of resources as their precarious financial condition would not have otherwise permitted financial support by PFC. It may be mentioned that OFAP conditionality was imposed on the insistence of WB/ADB. USAID, under the EMCAT project also extended support only to OFAP utilities. OFAP conditionalities have helped in improving the performance levels of SEBs as appreciated by the joint mission of WB, ADB and USAID (In November 1995), and also the EMCAT evaluation team, though more is still required to be done for ensuring commercial viability of SEBs on self- sustainable basis.

2a. Drastic changes are required to bring about appreciable and, sustainable efficiency increases and the SEBs undertaking these changes do so because they have no other choice.

In a recent Aide Memoire the World Bank concluded,"the project objective set before PFC of improving SEB performance through conditional lending is not achievable unless more basic reform measures on tariffs, independent regulation and privatization of distribution are adopted by the States for their power sector". This is due to several reasons. First, PFC's loan conditionalities help to strengthen performance at strong SEBs but do nothing to assist weak SEBs with necessary changes. Strong SEBs are those able to get sufficient state subsidies not necessarily those making important operational and managerial changes or in states undertaking important tariff reform. Second, those SEBs undertaking the major reforms have stated that they do so for two reasons: They are able to carry out the reforms because of large financial assistance from the World Bank and ADB; and, they have exhausted other possibilities and no other choice now remains. Third, reform requires large amounts of capital. As a DFI, PFC can't afford to take the loan position required to bring about restructuring at the SEB level. To do this, it would incurr too much risk. It is another matter for the World Bank or ADB to put $500 million in a few SEBs. They have a larger and more diversified portfolio.

PFC Comments: The project, namely, Power Utility Efficiency Improvement Project (PUEIP) as referred, envisaged improvement in the SEBs performance keeping in view the ground realities prevailing in the early 1990's, and was a part of the long term strategy for turn-around improvement in SEBs. Internal reforms rather than structural initiatives were considered as the only feasible alternative in the short term. The strategy adopted with the leverage of PFC assistance has contributed in improvement in performance of SEBs that has taken place since then. The impact of WB/ADB funding of US $ 515 million would be felt after the schemes covered under these loans are completed by 1997-98. The

analogy and reasoning attributed by the evaluation team are not consistent with the factual position and power sector scenario. The strategic framework of PFC's operations is to only assist weak SEBs with necessary changes as emphasised by evaluation team. Only such SEBs which are not willing to undertake necessary changes are not being considered for PFC assistance. SEBs which have undertaken structural reforms primarily have done so only after pursuing other measures and realising that the existing institutional framework may not enable sustainable improvements. The performance of the SEBs was much poorer five years ago. PFC's constant pursuance and insistence on improvement in the financial performance and functioning of the SEBs through appropriate linkages with PFC lending has contributed significantly in heightening awareness at all levels, and their concrete /response to improvement measures /structural initiatives.

As far as PFC's ability to meet large scale funds requirements emerging out of reform process is concerned PFC would be the most important Indian FI and would be contributing a significant portion of domestic resource requirement for the state power sector.

As mentioned PFC is and would remain as significant and critical source for funding state power sector requirements till the structural reform process is taken up and implemented. Leverage of PFC assistance would therefore act as catalyst for persuading the State Govts. for undertaking reform initiatives.

3. Planned Activities Still Relevant: Substantial changes have taken place in the power sector such as private power and restructuring at the SEB level. These changes have not obviated the planned technical assistance and training.

EMCAT was structured to provide TA and training on a wide range of subjects to the PFC and SEB's which qualified through the OFAP process to participate. With very few exceptions the skills needed to be an efficient SEB are no different than the skills required for an SEB to bring about the restructuring process. For example, tariff reform was an important part of the OFAP process even before "reformation". It continues to be an important aspect. To be sure, additional areas of TA and TR could be useful to reform minded SEBs in the areas of regulation and human resource development.

PFC Comments: With the experience gained during implementation of the EMCAT project and developments taking place in the power sector we agree to the need for reorienting EMCAT activities meeting the emerging requirements.

4. Course Topics Relevant but sometimes course content not relevant for both PFC and SEB.

PFC and the SEBs have fundamental different roles and therefore, very different institutional development needs. For example, project appraisal training should emphasize some of the same areas for both PFC and the SEBs. But PFC must learn to see projects from the point of view of a banker and SEBs from the point of view of the purchaser. This does not mean that there can't be some common elements in a course but rather

it means that there must also be separate attention paid to specific requirement of each participant group. That has not been done. For example BESP's TR#3, TR#6, TR#7, and TR#10 are totally irrelevant -for PFC's institutional development needs. However, some of these could have been designed for PFC to illustrate the typical investment requirements for T&D loss reduction and/or T&D upgrade projects and procedures to develop a bankable project for lending.

PFC Comments: The observations made are not consistent with the EMCAT project design as well as the functional requirements of SEB's operations. The project description annexed to the project agreement in no uncertain terms stipulated for "raining of PFC officials also in power sector operations. While PFC and SEB have fundamentally different roles, they have common objective of strengthening the state power sector. This necessitated PFC to equip itself with the insight and expertise in power sector operations, and, therefore PFC's participation in TR#3, TR#6, TR#7 and TR#10 is quite relevant. The observation for designing exclusive programmes for PFC is valid but, it could not have been addressed under the EMCAT Project, as under the Project the minimum training batch size was required to be 20-25 participants, and considering the organisational strength and the staffing pattern exclusive training programme on that basis for PFC was neither feasible nor practicable. The alterative option of nominating a few officers, say 2-3 at a time, for training programmes abroad was not covered under the project design. This aspect has, however, been taken care of by deputing PFC officers to the training programmes organised by institute of repute in country. The above position with details* was made clear to the evaluation team.

* This refers to comprehensive appreciation report given to the Team before start of Evaluation.

5. The IPPD project covers a number of areas which are in concert with BESP activities.

The IPPD is developing a number of products which are of great interest to all SEBs, one of the supply side clients. In fact, BESP has focused primarily on activities downstream of the busbar while IPPD have focused so far on generation activities. Together they support the full range of utility activities.

PFC Comments: This is not factually correct. While IPPD's focus has so far been on generation activities, transmission and distribution activities are also covered under the scope of IPPD Project.

D. EFFECTIVENESS

The goal of the EMCAT supply side component is to improve the efficiently of energy supply and to support private power development. Given the amount and type of assistance delivered and the broad based nature of projects assistance, it is difficult to expect or quantify progress in the short run. Thus, we measure the success in meeting planned activities and project outputs.

1. Very little TA has taken place in the first half of the project, rather the focus has been on training.

The project is to deliver 400 person weeks (PW) of technical assistance in such areas as development of manuals policy studies and pre-feasibility studies. To date a little more than 100 PW of activities classified as TA have been delivered. Activities better classified as training of 43.5 PW were included in this total. Technical assistance in the support of training activities will be discussed under "raining. The other 60 PW of TA were focused on preparing framework for the OFAP Project Appraisal and Investment Manuals a review of the PFC organization study and the improvement of PFCs library. Many of the benefits of these exercises are long term in nature and are not therefore measurable at this time. However. it is safe to say that the project is behind schedule in providing much needed TA.

PFC Comments: The main reason for shortfall in TA activity was the impasse over finalisation of report under TA#2 and TA#3 despite PFCs constant efforts to expedite completion and the fund flow constraints faced by USAID during the 1994-95. Three out of four TAs finalised for 1995-96 were kept on hold from November 1995 onwards on the advice of USAID.

2. Without a Training Needs Assessment Training will not be as effective as it should be.

Training courses were designed and implemented without a training needs assessment and it is no wonder that participants often claim that courses were too general in nature. Project design called for the PFC and SEBs to conduct the assessment with the assistance of the contractor. This is a major mistake.

PFC Comments: For 2 & 3

Since the requisite assistance was not forthcoming from the Contractor the training needs were assessed by PFC in consultation with SEBs. Consistent with the project design and the limited funds available the training programmes were focused on critical areas common to all SEBs. PFC with extensive and intensive knowledge of SEB functioning was well placed for identifying the areas and course contents in consultation with the SEBs. It may be mentioned that utility-wise requirement of manpower training and development, including training need assessment are being addressed through the specific action points covered under the OFAPs.

The training programmes identified were completely in line with specific areas outlined in project design.

3. Courses were less effective than they could be because the Contractor placed the onus of determining course requirement on PFC and the SEBs.

Quality and content of some training programmes were designed for general engineering professional development rather than the institutional needs of PFC and SEBs. For example, course materials of TR#9 indicate that it is a general introductory course for the power system planning process rather than "Techniques of Financial and Economic Appraisal and Monitoring of Power Projects".

The Contractor, instead of working with the PFC and SEBs, depend on the PFC and SEBs to take initiatives to develop the training course content. The Contractor's memorandum dated May 31, 1994 noted(more then one year after the EMCAT project started) that "writeups of several pages each are required from the PFC on all Tit's expanding on PFC and SEB needs and requested course content, at the very latest three months before each course is scheduled to begin.....At present, for many of the Tit's, all that has been provided by the PFC are one sentence course titles". We find that above statements are consistent with the inappropriate training course contents and the need for new. approach for designing training and study tour programs.

4. Overall there has been a lack of long range planning and poor management and coordination of assistance. Bechtel has failed to carry out several of the critical planning functions. For example:

Assist PFC to develop detailed EMCAT implementation, work and monitoring plans and collection of baseline data to monitor EMCAT Progress.

No such detailed plans exist and the 18 month workplans (Section F.6 of the contract) which would have formed the basis of the contractor's assistance in this project do not appear to have been prepared. No such report was available with the contractor, USAID or PFC. Instead the contractor developed annual action plans covering one year's activities.

Develop all required Scopes of Work (SOW). After the SOW have been approved by PFC, the Contractor shall propose at least two consultants for each consultant required.

For several key TAs, the approved TRs are different from the what has been delivered. Review of the files at USAID and the Contractor's office produced a set of TRs on which approval to mobilize the teams was given. The drain manuals differ from these TRs and comments from PFC further indicated that they expected more detailed information than what was provided. Many months after the first drafts were submitted Bechtel's summary report of TAs one thru three contained a new set of TORs which were different from the original TORs. The new set of TORs can't be documented as having been approved by PFC or USAID. Also, the contractor does not propose at least two consultants for each task and this is a major source of irritation with PFC.

Training-first priority: assist PFC and SEBs with an in depth training needs assessment building on any assessment already completed or in progress...Training Coordination Role...First Priority: assist in reviewing portions of training needs assessments already completed by PFC and

the SEBs; provide assistance in conducting additional training needs assessment in each EMCAT activity area as required. This will require an early visit to India lasting at least several weeks.

The contractor's training coordinator visited India in May 1993 but it was not until six months later and after work had already begun on training courses that the contractor undertook a Training Planning and Implementation study. This study was an outline of a training needs assessment and training plan. The section of the report covering the need assessment was barely one page with no detail to assist PFC or the SEBs. No other assistance has been provided to PFC or the SEBs in training needs assessment. From the training needs assessment flows the training plan and this provide invaluable information to course developers. Without such information it is simply hit or miss to target the level of difficulty and course content to the participants needs. To date no training needs assessment has been carried out and over 50% of the training has taken place.

It should also be noted that the person delegated to perform the above referenced work did not meet the contract requirements. He had little previous experience in "organizing training for electric utility professional staff and management"

Coordinate India and US course content to ensure congruity and continuity.

This has not taken place either due to the absence of a training plan based on training needs assessment or to concrete interaction between the contractor and PFC.

PFC Comments: These comments relate to the Contractor's failure in carrying out several of the critical planning functions and it would therefore be appropriate for the Contractor to comment on these findings.

5. PFC's role in the approval of BESP project activities has impeded both the type and amount of assistance.

The contractor's annual workplans attempted to link technical assistance and training and to do so in key areas where PFC and the SEBs require assistance such as strengthening skills in development finance and restructuring/ privatization. According to contractor documents the work plan was developed in close coordination with PFC and many of the TAs and TRs were originally approved. Yet PFC later rejected TAs and TRs in areas important to its own institutional development. TR# 1 was to have been training on investment planning to meet the critical needs of PFC. it was originally approved by PFC but once designated it was rejected as it was exclusively for PFC. TA#7 was designed to provide a seminar in investment planning and was approved by the Chairman on 2123194, it was never implemented.

PFC Comments: The observations on rejections of TAs and TRs primarily refer to TR#4, TR#5 and TR#7. PFC had the valid reason for the decisions taken. TR#4 on "Managerial Practices including HRD and Manpower Planning" was cancelled as it was found that it could better be

held in India. TR#5 on "Vendor Evaluation and Procurement Procedures under World Bank and ADB Guidelines" was deferred as the WB suggested that the course could be held in India with the faculty provided by the WB. This however could not materialise in spite of repeated follow up with the WB. TA#7 on MIS was included in the work plan for 1993-94. This needed to be deferred till 1995-96 as the TR on this activity was completed only in October 1994. The activity could not be completed during 1995-96 as the same was put on hold under US advice.

For lack of any other analogy the process has been much like a patient telling the doctor what his illness is and how to treat it, rather than describing his symptoms and seeking the doctor's guidance. The result has been the exclusion of important TA end TR in policy areas or in banking related activities. For PFC to become an effective DFI, it required technical assistance and training in areas such as risk management, accessing capital markets, funds management end a wide variety of other banking related areas.

PFC has not seen the need in the past to use the project as a vehicle for gaining these skills. It does not point to in country courses it selected in this area. However, a review of these course indicates that they were not chosen to meet critical banking needs.

PFC has been slow to comment on work products. The long delays between delivery of a project and PFC's comments means that (1) the final project is not available for use for long periods and (2) by the time comments are received, the concerned consultants may no longer be available for quick response. For example, TAs 2-3 were delivered in December 1993 but PFC's full comments were not until May 22, 1994. For other TA .products the turnaround time is running between one and one-half to two months.

PFC Comments: The observations on long delays at PFC level are also not factually correct. Soon after the receipt of TAs a meeting was held by the Director (IDA), PFC with USAID and BESP's representatives on 3rd February 1994 expressing PFC's observation and concern on unsatisfactory delivery of TA#1, TA#2, and TA#3. It was agreed that formal comments of PFC would be withheld till BESP representative examine the reports with reference to the observations of the PFC.

6. BESP and IPPD while working out of the same office, have not intentionally coordinated their TA and TR activities.

BESP and IPPD assistance can be more effective if they coordinate activities to enhance products and avoid duplication. For example, they both had planned activities in privatization, utility restructuring and database development. It is conceivable that, without co-ordination, their outputs may have some duplication.

PFC Comments: Position given in the example cited is not factually correct. BESP had undertaken only one activity with emphasis on private power development in October 1994 (which was before IPPD came into effect). After the commencement of IPPD activities (since March 1995) PFC has ensured proper coordination in BESP and IPPD activities.

E. IMPACT

1. Judged by the log frame purpose level indicators the project has not made significant headway from FY 92/93 to present.

T&D losses were 21.8% (FY 92/93)Vs. 21.5% (FY 93/94)
Thermal PLFs have increased from 54% (FY 92/93) to 55% (FY 94/95).
Captive generation is increasing, albeit at a slower rate
Cogeneration is virtually nonexistent.

PFC Comments: The comparison is neither consistent with the project design nor could be logically related to project impact in the short-term or long term. Moreover, along with the bare comparison, the impact of the important assumptions made in log frame work ought to be considered for an objective assessment.

It is difficult to determine to what extent the project had contributed to these changes, if at all. Through examination of the data fail to identify that trends had been established. However, it should be noted that the assistance has been in a wide variety of areas which may only remotely contribute to the movement of these indicators. Given the very nature of the assistance provided and the problems which it is attempting to solve, these long run indicators will not provide useful information about the project's success in the short run.

PFC Comments: The Project benefit was targeted for OFAP Utilities and therefore comparative assessment of all SEBs performance is not correct. The improvements in SEBs having OFAP are significant as brought out before the Evaluation Team through the background material as well as presentation.* The references to Captive Generation and Co-generation is not relevant for EMCAT supply side component.

* This refers to a comprehensive appreciation report on the project given to the team before start of evaluation.

2. The impact of Bechtel's TA is mixed. In the area of Power Sector Investment Planning there are two factors which have limited the effectiveness of TA in this area: the reluctance of PFC to approve TA and the time it has taken to complete the approved TA.

The problem of PFC's rejection of TA has been discussed above. It impacts both the quantity and the quality of TA. This section will address the contractor's role in carrying out the TA.

2a. The "Manuals" are of reasonable quality but sometimes fail to focus on key problems identified in the findings and issues of the summary report.

PFC Comments: For 2a & 2b

For example, the summary report finds that there is "insufficient emphasis on financial appraisal and appraisal report does not contain dequate analysis of the ability of the borrower to repay the loan or of the project to generate sufficient cashflows to service the debt of a project". These are important observations which are not explicitly addressed in what is to be framework for experts to develop a manual. There is no mention of the technical analysis/evaluation. Does this indicate that it should not be part of the Appraisal manual? Other important omissions include the lack of discussions on the least cost plans and their relation to the evaluation and approval process.

On the TA side, BESP project assistance has focused primarily on three annuals. The OFAP manual was finalised in late 1994 and the project appraisal and investment manuals have still note received final approval from PFC. Thus it is unlikely that they have had nay measurable impact. Two other TA products are the PFC Library Development and the Review of the PFC Organization Study. The benefits of the PFC library can't be measured.

PFC Comments: In addition to comments related to TA#2 and 3 made above it has to be appreciated that unless the TA report is found satisfactory its mere completion does not fulfil the intended objectives. The concern of the PFC was to make the consultants undertake additional work for satisfactory delivery and PFC made earnest efforts for their expeditious completion. The remaining TAs have been completed and the reports have been implemented or are under implementation.

2.b While there are quality problems with the Manuals, the perception of their failure is greater than it is in reality.

There is a general impression that this TA failed to achieve its TORs and is of generally poor quality. This is more a problem of presentation and planning than of substance. The process of planning, presenting and managing the TA for manuals is extremely confusing. This confusion is further compounded by discrepancies between the documented TORs and the final TORs used by the contractor. From the start these products are inappropriately labeled as manuals. The TORs describe them to be frameworks or outlines. Another generic problem is that these outlines are divorced from the finding, conclusions and recommendations of the TA team These findings, conclusions and recommendations are in general good but appear only in the summary manual. They should appear in each framework so that future consultants finishing the manuals will have a more thorough understanding of the PFC's needs.

The team examined the Project Appraisal and Investment manuals and their transmittal letters in detail. The problems of determining the official TORs was discussed above. Regardless of which set of TORs in used, some confusion remains. The contractor's file die not contain the drafts submitted in early December to PFC and in each manual no mention is made of the TOR It would thus appear that this is a final product and no is required by the contractor. It clearly states on page 5 of the Project Appraisal Manual "It is the responsibility of the Director of the Projects Division to keep the contents of this manual up-to-date". No further mention is made of the work which remains to be completed before this is a fully developed manual.

The second year annual work plan includes TA to complete the manuals but no mention of this appears in the manuals themselves. In July of 1994, Bechtel submitted a summary report on the three manuals. Herein were contained the revised TORs. Appendix One presents the recommended next steps in the Development of the Manuals. It suggests that TAs be prepared for completion of the Appraisal Manual and that consultants complete the manual This is not linked to TA 17 of the second annual work plan. In fact it identifies 9 steps to completion and yet none of these appears in the BESP annual work plans. this appendix also indicates that the Investment manual requires further work to be carried out by consultants. Since the required consultants are not linked to work plan for identified as Bechtel consultants, the impression could tee that Bechtel feels it has discharged its responsibilities. This is in conflict with either set of TORs.

A similar disconnect arises with regard to the TORs requirement of the training needs assessment in each of these areas. It appears in a later summary report but no mention is made in the manual.

3. The remaining Bechtel TA has been in Information dissemination and policy dialogue. BESP has carried out a major TA in support of this effort at PFC.

BESP has provided TA designed to assist PFC in improving their library. This TA has made a great impact on acquisition of materials, structure of the data and making information available to users. In alt this has been well designed and implemented.

4. The impact of US Training has been more to acquaint participants with concepts or a new way of looking at a problem than it has been to transfer skills.

As a needs assessment was not carried out, the courses tended to be very general in nature, often covering subject material which the participants were already well acquainted. However, one major benefit of the US training has been to show participants that more efficient alternative systems and methods exist. Looking that the same problem in a new way, even in very general terms, can be a major catalyst for reform and innovation. Transfer of skills would have been more effectively carried out in country and would, therefore, have had a greater impact by reaching more people or the same number of people for longer periods, assuming proper needs assessment.

PFC Comments: The courses were identified consistent with the project design, end were in the areas critical to State power sector operations. Since the emphasis was on technologies, system and practices followed in US it may not be correct to state that the participants were already well acquainted. The project envisaged 1500 person - weeks of US training, and in order to maximize the advantage it was spread to a number of programmes in identified areas having 4 - 5 weeks duration. The training programmes were accordingly designed to ensure that the participants were able to understand, appreciate and develop their ability for comparative analysis and translating US practices under Indian conditions. In addition to the US Training Programmes, Indian training has been imparted for up gradation of skills to PFC and SEB officials by nominations for over 100 training programmes. PFC officers in particular were sent for courses dealing with specific areas like international capital markets, funds and investment management, foreign exchange management, raising finance from Financial Institutions (FIs), credit rating for public sector enterprises, international finance and global capital markets, disinvestment in public enterprises, portfolio management and a host of other training courses relating to investment banking etc. Considering the feed back received from the participants and interaction with the SEB's top management, US training programmes and study tours have been of great advantage in changing the mind-set, acquiring new skills and developing the management capabilities of PFC/ SEBs officials.

F. EFFICIENCY

1. Project activities are not as efficient as they could be.

Currently TA consultants leave the country before preparing a draft final report. In the past this has resulted in significant delays in finalizing the product. Moreover, it has taken much more of the resource coordinator's time to finish the products and/or interface with PFC than would be necessary if the consultants had face-to-face debriefing with the clients and address their comments before leaving.

As mentioned above, US based training has too often covered topics which are just as easily taught in India. They have provided little or very little input which is unique to the US experience. It is more cost effective to send one or more trainers to India to teach the course and train trainers, than it is to send a small number of participants to the USA.

PFC Comments: PFC appreciates the point made. In fact such an arrangement was evolved and followed in respect of TA # 8.

2. The resources coordinator functioned as an expensive office manager rather than a coordinator of resources.

The previous position of resource coordinator operated not in coordinating resources but more as an expensive office manager. Workplans which should have been developed by the resource coordinator were allowed to be developed primarily by another individual This resulted in additional costs to the project and the preparation of planning documents by an inappropriate person. The evidence indicates that this position acted more

as purely logistical support with a bare minimum of interface with the client. A local person performing these duties would have been appropriate and far more cost effective.

G. SUSTAINABILITY

1. As the project was designed, no provision was made for sustainability or replicability.

The EMCAT training programme has provided "raining workshops in a variety of power sector disciplines in U.S. and in India. There are several training courses of energy efficiency improvement, most focusing on increasing T&D and power supply efficiencies, and with little or no emphasis on institutional development needs of PFC and SEBs. None of the training courses cover the specific institutional needs in the areas of designing a bankable project and/or procurement rules and guidelines for the multilateral banks. No provision has been provided for the follow-up training for selected former trainees or plan for in-country refresher courses one or two years after completion of US training program. Dissemination of training information needs to become an integral part of the training process.

Training courses and study tour programs did not have an information dissemination activity. For example, returning trainees could have organised seminars/ workshops on the same training topic and used the training materials in their respective institutions for information dissemination and institutionalization of the training program. Another major shortcoming noted by team was the lack of institutionalization of the TA and training courses. All training courses could have been designed with class nots, hand-outs, and procedures for specific problem solutions under the Indian environment, so that the participants upon resuming to India could undertake a variety of information dissemination activities including teaching similar training courses in their respective SEBs.

PFC Comments: The observation that none of the training covers specific institutional needs are not consistent with the project design and the approach followed. Training programmes under EMCAT have been designed to have maximum multiplier effect with the limited resources made available, and, were not the only outlet for meeting the training needs for PFC and SEBs. As explained to the Evaluation Team, PFC officers have been deputed for "raining in institutes of repute, in areas relating to development banking operations, HRD information technology, MIS, etc. As far as SEBs are concerned OFAP provides for different action points relating to training needs assessment, training data-base, and provision of training to different category of employees in various areas. SEBs accordingly also organized training programmes in-house or nominated officers for training as per their institutional developmental needs.

The dissemination of the training information is an important area. Based on the experience gained it has recently been decided that the officers exposed to US training would prepare specific projects for their own organizations and seminar/workshop would be conducted first in their own organizations and later on at national level. Such a workshop was planned in respect of TR-11 on "Strategic Planning and Management"under a

special TA(TA-22) which however could not materialize as the project activities were put on hold under USAID advice. As far as the seminar/ workshops are concerned the recommendations have not only been disseminated to all SEBs/State Govts and other concerned agencies but also publicised through media. These recommendations are constantly followed up for implementation. In many cases review workshops have been held which also in a way substantiated the impact of the workshops in efficiency improvements.

Strengthening of internal management consultancy groups in SEBs would be an important step. This suggestion made to the team, though agreed to, did not find mention in the report.

H. HOST COUNTRY CONTRIBUTION

The Host country Contribution (HCC) of this component is budgeted for US $ 5.3 million. Disbursements as of 12/31/95 totaled to US $ 1.87 million (3 %), the majority of which is related to the Training component.

PFC Comments: No comments.

I. CONCLUSIONS

. PFC will not, for the foreseeable future, be a major source of financing in the overall power sector and can't be expected to be the catalyst for major reforms which are necessary in the power sector.

. If PFC is to achieve important gains within its constraints, it must change its role. Otherwise, it will dilute its asserts in a variety of areas without contributing to the important changes which must and inevitably will take place. It can increase its ability to assist in bringing about change by targeting reforms SEBs for special assistance, particularly in renovation and modernization. It can also participate in loan syndication with the World Bank, ADB and commercial Banks.

. Since PFC has been unable to assume the role which envisioned for it in project design, USAID's assistance to PFC can't be expected to have the importance or to contribute to the project's goals at the same speed.

PFC Comments: For 1,2 & 3
PFC would continue to be premier developmental financial institution in power sector as made out in the comments made earlier. The strategic positioning of the PFC for funding R&M, Transmission and Distribution investment requirements and for dealing with developmental issues concerning power utilities makes it the key agency suitable for playing a catalytic role in the reforms process. PFC has already undertaken major

initiatives for continuously remaining as premier development financial institution dedicated to power sector in the emerging scenario. The details on the PFC's plans and strategy frame works including the initiatives already taken justifying the above stand have been provided to the Evaluation Team.

No where the project design envisaged PFC as the sole provider of funds to State Utilities. It has been and would continue to be the major domestic financial institution meeting the SEB's requirement of same magnitude of funds over and above plan allocations. The Evaluation Team has itself stated that PFC has made some solid contribution to the Indian power sector (Report Finding Item 2, Page 2 of this report). The strategic positioning of the Indian power sector and its proposed plan for growth enhances PFC's significance and relevance for the state power sector.

. Much of the assistance that is given to PFC will show measurable impact on the project's performance measures only remotely and only in the long run. However, the teem has determined three areas where EMCAT can and, perhaps, should work along side PFC, R&M, policy studies and information dissemination. Additionally, assistance should be provided in banking functions such as risk management, investment planning, capital markets access and foreign exchange markets.

. USAID can either concentrate on supporting PFC or concentrate on supporting much needed technical assistance in the SEBs. But it can't do both well with its resources.

PFC Comments: For 4&5
The Team has failed to understand and appreciate that the EMCAT project is apart of strategic Frame work of PFC's operations and is closely interlinked with the lending and other developmental functions. The Team has not elaborated the advantages accruing by the delinking a portion of EMCAT activities from PFC.

. USAID's BESP related assistance has not shown much of an impact for a variety of reasons principal among which are: a) it is spread over too many topical areas; b) it has not focused on providing the priority assistance which is needed at a specific point in PFC and the SEBs developed; and c) management by the contractor, PFC and USAID did not provide sufficient quality control and only partially met the SEB/ PFC needs.

PFC Comments: The conclusions drawn are not consistent with the project design and the scope. The Team while has sought to assess the impact of the Project based on the global indicators has not indicated has to how the activities pursued did not make desirable impact. Such an assumption would require an qualitative assessment of the measures undertaken. The fact that the project needed review and re-orientation in a dynamic context should not lead to summary assumption negating the impact of the activities pursued so far. Activities pursued with reference to milestones prescribed under the project would indicate towards satisfactory progress achieved so far.

The project with such a meagre resources could have only be expected to partially meet the SEBs/PFC's institutional development requirements. While there have been delays in completion of a few TAs, PFC has no where failed to provide sufficient qualitative control. An exclusive project management cell with adequate professional expertise has devoted itself to the task of project management.

. If USAID is to achieve quantifiable gains with its relatively small assistance, it must leverage and focus its assistance.

PFC Comments: We agree.

. If EMCAT and IPPD activities are carried out in close coordination and treated for planning and management purposes as one project, they will support one another an the impact for their combined effort will be greater than that of their separate efforts, particularly as they focus at the reforming SEB level.

PFC Comments: We agree.

. Given the changes in the energy sector since project design, the original activities are all relevant but some new activities are now important to SEBs such as TA in privatisation, restructuring and regulation.

PFC Comments: We agree.

. US based training which does not impart something unique to the US experience is not cost effective.

PFC Comments: Considering the impact of earlier programmes, the US based training continues to be most relevant. The emphasis on such training will have to be on US specific experience relevant to Indian conditions which is normally not available with Indian training institutions.

. TAs begun in India but finalized abroad are not cost effective.

PFC Comments: We agree as it will also help in closer interaction and the draft will be more realistic and cost effective.

. The sector's problems are more financial managerial and political than they are engineering/technical.

PFC Comments: It is not wholly true. In the present context the financial managerial etc. problems may be more critical then engineering/technical.

. The project has suffered because the resources coordinator's title was taken too literally. There was not proactive role in anticipating the clients needs or active involvement resolving them. There was very little technical component to the coordinator's performance.

PFC Comments: Comments of BESP may be of relevance on this item.

. There has been a lack of clear and effective communication among all parties.

PFC Comments: As far as PFC is concerned there has not been lack of clear and effective communication. This area however can be made more effective where ever required in consultation with BESP.

. The log frame objective and purpose level performance measures are long run in nature and to judge performance in the short run other indicators are required.

PFC Comments: The approach of the team in linking long term objectives and proposed level of performance to the EMCAT activities does not seem to be appropriate.

. For technical assistance to have much of an immediate impact, it needs to be available in a timely manner. One bottleneck to quick delivery of the final product is the PFC review process.

PFC Comments: Factually not correct as explained

. If the new resident advisor's position is to provide the support and do so effectively, there will need to be change in attitude with the advisor being more involved in the day-to-day delivery of assistance and in communicating with PFC and the SEBs.

PFC Comments: No comments

. Lastly and most important: the failure to plan is a plan for failure.

PFC Comments: While we are in agreement with this general statement, it is not correct for this case as there has been no failure to plan. The EMCAT Project was designed in the early '90s considering the ground realities of the power sector available at the time. The implementation of the project started from May 1993 and has been as per the project design. Summary observations as made on the project performance - following different set of concept, philosophy, strategies and changed power sector scenario does not seem to be appropriate. We may re-emphasise that the

project was being implemented as it was planned and on the part of PFC there has been no failure to plan. Project design if no longer valid could be changed resulting into change in scope and strategies. This can not be construed as failure to plan.

J. RECOMMENDATIONS:

The team's investigation indicated that the assistance being provided was too ambitious in scope and the funds too few to bring about measurable change in the sector. The needs of the sector are real and concrete and this offers the project an opportunity to focus on a few key or pivotal areas of assistance. There has been widespread agreement that the project should focus on a few areas at a few SEBs and PFC. Our investigation also indicated that the manner in which the assistance was provided proved to be a bottleneck to assistance and future project implementation must consider service delivery. The recommendations improving the project appear below. These recommendations are based upon the team's work in India and our collective experience in energy projects around the world.

PFC Comments: As mentioned the project was well designed, keeping in view state of the SEBs problems and prospects under the ground realities prevailing then and was an integral part of a long term strategy required for reforms in state power sector. The project activities were integrated with PFC's total operation i.e. lending and institutional development. In order to maximize gains from the meagre funds available under the project focus was on critical problems and issues common to power sector utilities in the state sector. The strategy has brought about perceptible change in heightening awareness and appreciation of the problems faced by SEBs and accordingly initiating measures required for improvement. Wherever the problems are insurmountable the strategy has fostered structural initiatives. This has been reflected by the increased commitment of the State Govts. in the form of tariff revision, provision of subsidy, etc. and measures taken by the SEBs towards improvement in operational financial end managerial performance.

While there could be need for review of the project objective and scope, it cannot be said that the project was too ambitious in scope. The Project could focus on comparatively fewer areas. In a dynamic context the project should focus on a few selected areas which would accelerate the reforms process.

Area #1: Management & Planning Activities

. EMCAT project planning, budgeting and implementation needs to be improved. A work plan covering the life of the project should be prepared and used for planning purposes. Annual work plans will be prepared keeping in mind the comprehensive work plan. This comprehensive work plan is a moving target and needs to kept up to date as and when task are completed or rescheduled. Implementation requires closer involvement between the contractor and the client in preparing Control Work Plans and tin service delivery.

. The contractor should be required to develop the new comprehensive work plan, training needs assessment and training plan.

. There should be biweekly meetings between the Contractor and USAID and the Contractor and the Client to review the status of ongoing and planned activities.

PFC Comments: Activities 1, 2 & 3. We agree

. PFC should consider changing the review relationships. It is recommended that PFC consider the following model. The Chairman, in consultation with the directors, determines the proportion of EMCAT assistance going to each of the three PFC divisions, Finance, Projects and Institutional Development. Within these bounds the contractor works with each Director to determine his requirement, finalise work plans and submits the final product.

PFC Comments: The project was to be looked with holistic approach in totality. Accordingly, it should be coordinated and implemented as a whole with the single point responsibility. The work plan should continue to be finalized as in the past after due consultation with the division concerned within the PFC.

. Following suggestion of USAID and the agreement of the Chairman, PFC, an EMCAT Advisory Board should be formed. The purpose of this advisory board is to assist in implementation of the evaluation recommendations, focus the project and direct future activities.

PFC Comments: CMD, PFC had agreed to the suggestion of USAID provided the Advisory Board is made the final authority for taking decisions on project related issues without need for subsequent approval by the USAID, GOI etc.

Area #2: Client Relationships

1. To increase the speed of service delivery and to assure that it meets the needs to end-users, the project should change its reporting relationships. PFC's vision 2000 will place PFC on the path of a full service DFI and the team realizes the benefits of treating PFC more as a partner, as are other DFI's, in this process than a client. This also necessitates a change in relationship. This change has already taken place as the team worked with the World Bank, ADB and the PFC in establishing the priority needs of the SEBs.

PFC Comments: The change in the approach for the project implementation and client relationship as suggested is not agreeable as the same may not be practical and more effective. The team has neither given the reasons not the comparative advantage accruing from the alternative

approach. PFC having developed expertise and experience of the state power sector and the problems is better placed for effective implementation of the balance project. PFC also has the added advantage of linking the desired changes at the SEBs level with its lending operations.

a. For assistance provided to PFC for institutional strengthening, PFC, is the client and the contractor should naturally work with PFC in developing work plans and tasks. The contractor should finalise these plans in consultation with PFC.

b. For assistance provided to SEBs, the individual SEBs are the clients. It is anticipated that much of the work will be developed for or at a single SEB but made available to any other interested SEBs. Therefore, the contractor should work directly with the SEBs in developing associates work plans and tasks and they, the SEBs, should approve these. For example, work in preparing staff for restructuring will be developed and implemented at a single SEB. It can later be replicated at or by other SEBs. It is also envisioned that many of these activities will support PFC's vision 2000. For example, the extension of Renovation & Modernization TA will provide opportunities for PFC loan appraisers to work alongside consultant and the SEBs and to develop bankable projects a as a result.

PFC Comments: PFC Vision-2000" envisaged aggressive role for meeting the developmental requirement of the power sector. The approach suggested by the team would rather lead to duplication efforts.

c. The categories and priority of assistance were developed for a group of reform minded SEBs. This is not to infer that nonreforming SEBs would be excluded from training or the benefits of technical assistance. Rather, the areas chosen for TA recognize the immediate needs of reforming SEBs and would be implemented in those SEBs. In al but a few cases, this TA and training is of use to all SEBs. Nonreforming SEBs would have access to training on a space available basis and later through Administrative Staff College of India (ASCI) courses. These SEBs would benefits from TA products which after completion would be placed in the PFC library.

PFC Comments: The suggestion that SEB would have access to training through one institute is neither appropriate nor practicable as elaborated later. The contractor would also not have requisite expertise and the manpower resources for carrying out the activities in different areas of the utility performance under conditions prevailing in the Indian Power Sector.

2. EMCAT should work in close concert with the PFC, World Bank and ADB in supporting and reinforcing positive ovements in the power sector it is imperative that efforts not be duplicated or be counterproductive. Therefore, it is recommended that EMCAT assistance take place in support of World Bank and ADB initiatives in SEB reforms.

Area #3: Funding and Contract Extension

1. It is recommended that the Bechtel Contract be extended to the December 31, 1999. However, direct support by the Resident Advisor would be phased out by the end of 1998. Activities in the final year of the project would consist of training provided through ASCI to the SEBs and replication of TAs by local consultants. The activities covered under the IPPD component should likewise be extended to December 31, 1999.

PFC Comments: We are generally in agreement with Para-1, 2, and 3.

2. It is recommended that USAID obligate the remaining funds for this component.

3. At this time additional funding can not be recommended since the impact of restricting US visits and converting the training coordinator's position to a local hire and the more active involvement of resident advisors in providing technical assistance can't yet Šbe assessed it is, therefore, recommended that the contractor derive a new budgets to reflect the changes agreed upon by the GOI and USAID. The evaluation team supports the injection of funds, as required, to extend the project.

Area #4: Training and Technical Assistance General

1.3 The technical Assistance and Training should become sustainable and replicable by bringing an important training institute such as ASCI into the process. They will be able to work alongside project trainers and later provide the material out of their institute. Also assistance would be given to PFC to increase their library's ability to collect and disseminate the EMCAT deliverables to outside parties.

PFC Comments: It is not clear as to on what basis the Evaluation team has proposed Administrative Staff College of India (ASCI) as the training institute to be brought into the training process. PFC in fact has been utilizing the facilities available at different Institutes of repute such as Power Management Institute (of NTPC), Noida, National Power Training Institute, Faridabad, management Development Institute, Gurgaon, Engineering Staff College of India, Hyderabad, Indian Institute of Management Studies, Ahmedabad, Institutes of Cost and Works Accountants, Institute of Financial Management and Research, ASCI, Hyderabad, based on their core competences. Such as approach has also enabled in keeping the cost of in-country training programme to an optimum level. As per our information the Evaluation Team has not evaluated any of the institutions. A great deal of coordination is required for providing training in different areas of utility performance and a lot of follow up action is necessary even for getting nominations from the power utilities in the country. None of the training institutes is equipped or has the expertise required for handling all aspects of the training alone. It may also not be practical to designate an institute located at one place for catering to the training requirements of the utilities through out the country.

2. US visits should be limited to only those activities which are unique to the US experience and which can not be presented well in India. Participation in the regulatory process is an example of training appropriate for the US. Cost accounting is an example of a course better taught in India. In effect, this means that no US training is recommended. Study tours to the US and other countries are recommended as appropriate.

PFC Comments: As commend earlier the recommendation is not agreeable. The recommendation is also not consistent with team's earlier observation on need for US based training unique to US experience.

3. There is no longer any need for US based training coordinator. Since the emphasis will be on local training, a local training coordinator should be hired to work under the direction of the Resident Advisor and in close coordination with ASCI and the client. Assistance in arranging and facilitating study tours will be provided on an needed basis in each study tour Control Work Plan.

PFC Comments: US training is very much required as per our need assessment. However to make it most cost effective it could be coordinated from India.

4. Prior to any training provided by the project, the contractor should develop a training needs assessment with assistance of the final clients.

5. The contractor should develop the course outlines based on discussions with the client rather than asking the client to develop the course outlines.

PFC Comments: For 4 & 5.
The development of training needs assessment/course contents should be carried out by PFC in association with the State Power Utilities and the contractor should provide the necessary inputs in these areas. Such an arrangement would be more conducive to the implementation of the training activities.

Specific:

PFC

1) **Banking Oriented TA and TR -** It was observed by the team early in the process that PFC had failed to develop sufficient skills in banking functions. This observation was further confirmed by the Chairman and by subsequent interviews with PFC staff. Immediate

needs include the areas of assessing capital markets, standardising loan applications and loan review process, financial engineering, risk analysis, and more attention to analysis of projects from a bankers point of view rather than one of engineering.

PFC Comments: While the areas given are of interest to PFC, PFC would not be agreeable to a diluted role of a partner client to the extent of about 20% in the EMCAT project. All the activities under the project should be implemented through PFC only.

Since this area is agreed upon by all, it is recommended that assistance can be immediately provided in developing a standard loan application and loan application process and completing the project appraisal manual along with on-the-job training in appraisal with special emphasis given to the role of credit analysis. This is not intended to provide project appraisal skills for the SEBs. This work should be coordinated with the Director, Projects, PFC. The remaining area can be addressed when the workplan is developed in coordination with the Director, Finance, PFC.

2) **Policy Studies** - There are a number of policy issues which are better decided on a national level rather than state. This is due to two factors-the need to avoid duplication of effort and the fact that some of these issues involve interstate transactions. Issues which need to be addressed include: 1) bulk tariffs; 2) lifeline rates; 3) interstate transport of power; 4) role of renewables and nonconventional energy; 5) review of National policies which impede energy efficiency; and 6) environmental and social issues in power production. The contractor should work with the Director, IDA, to determine the appropriate needs and develop the workplan.

3) **Information Dissemination** - PFC's own vision 2000 and the team's meetings with SEB confirms a need to concentrate on the collection of information and dissemination. SEBs are entering into a number of studies which have potential benefits for other SEBs. The problem is not one of adapting a study from one particular SEB to another. The problem is more basic; one SEB does not know what the other SEB is doing. It is recommended that the project undertake a quarterly newsletter as a forum to announce studies and topics of concern to all SEBs. This should be housed at PFC as central custodian of this information.

PFC Comments: As suggested to the Evaluation Team what is more important in this regard is creation of a common data base accessible to all utilities through online information exchange, i.e. POWERNET. EMCAT support for POWERNET would be a major step in this regard. PFC also suggested full support under the Project to internal management consultancy groups in SEBs for development and utilisation of internal skills in problem solving and other areas. These two important suggestions agreed to by the Team do not find mention in the report.

SEBs

Based on meeting with seven SEBs, the team determined that the following areas of major concern and should be addressed by EMCAT. Our meetings were not sufficient length to determine the precise needs in each topical area. However, this process has narrowed the focus and it is recommended that the resident advisors continue this process in meetings with the individual SEBs, something the SEBs requested in our meeting.

PFC Comments: The areas of major concern indicated by the SEBs are well understood and are already under PFC's focus. Seminars/Workshops/Training Programmes are being organized by PFC keeping in view the importance of these and related areas as also reform process in the power sector.

1) **Human Resources Development** - All the SEBs interviewed expressed this as a major area of concern and one in which they have no outside assistance. Areas recommended are to assist targeted SEBs to develop organisational structure, define jobs, competency profiles, and establishment of work norms or productivity/performance measures. EMCAT could develop and assist in implementation of the interim systems and procedures, such as recruitment, grading and remuneration necessary to allow transfer from SEB to other State Government enterprises. Additionally, EMCAT could develop, in conjunction with the chief executives and his team, the human resources strategies, policy, procedures and practices needed to support the corporate goals of corporatised SEB enterprises.

2) **Regulatory Issues** - The establishment of an independent regulatory body is a precursor to effective restructuring. In fact, one SEB not considering privatisation had, nonetheless, expressed an interest in a regulatory body. The team determined two areas where assistance is important. First, there is a need to "sell" the concept to senior policy makers. This could be established with a series of white papers and high level seminars. Second, assist reforming SEBs in establishing regulatory functions and develop a regulatory processing plan for these functions within the context of current regulatory reform in India and legislative mandates. Furthermore, for all other functions which are periodic in nature, recommend regulatory processing time limits and service level goals. Provide appropriate training programs for the Regulatory Agencies in the areas of utility rate design and financial analyses.

Develop staff capabilities of Regulatory Agencies to monitor and to evaluate the technical, economic and financial implications of private power projects and privatised distribution utilities.

Develop training programs for the Regulatory Agencies in the following areas:

- Seminar on regulation of public and private utilities;
- Seminar on rate design, revenue allocations to customer classes;
- Project economic appraisal; and
- Other training program as needed.

Communication training for both internal and external purposes.

3) **Customer Relations** - This is a relatively new concept in public services and in which all SEBs expressed an interest in obtaining assistance. Areas of concern were fault repair systems, information technology, and rural interface mechanisms.

4) **Unions** - SEBs recognize that they are not skilled in dealing with unions in general and employee relations. They have requested that EMCAT provide assistance in this area including collective bargaining.

5) **Load Dispatch** - SEBs expressed a need to have assistance in this area particular in communication procedures and technology.

6) **Competitive bidding support** - The Center has recently amended its policy to allow for projects up to 400 crore to be undertaken by the SEBs without requiring CEA clearance. In addition, the Centre has given hint to the possibility of issuing a bulk rate tariff policy designed to simplify the competitive bidding approach (although not until after elections). Regardless, electricity boards will need to develop a robust bidding process that ensures qualified offers are elicited at acceptable tariff. Development of such a methodology at a national level (currently being undertaken by IPPD) will provide general principles and guidelines that can be used by electricity boards. Additionally focusing this effort towards an individual SEB(s) would provide greater leverage and demonstrable success of USAID support in the private power sector.

Several needs have been identified: direct TA to an SEB in implementing the guideline principles to an actual bid program that could be undertaken on a demonstration basis.

The opportunity exists to make substantive contribution in a state by supporting the development of a new facility (or suite of facilities) in a streamlined, replicable manner. It would complement the activities of the World Bank and ADB as their assistance efforts are now focused at the state level. This success could be reinforced by attracting other funding support (e.g., World Bank, PFC, ADB for a similar activity in one or more other states committed to reform and in need of such assistance.

7) **Bulk Rate Tariff** - The formulation of a sound bulk rate tariff policy (ala Pakistan or California model) could accelerate the introduction of new capacity by the private power sector by shortening the current MOU/Competitive bid PPA negotiation process and increasing the flexibility of the private sector to respond to specific needs of the SEBs and Central Power Sector.

TA should be intensively focused on key Centre agencies including and MOP and DEA. If successfully developed, TA should then be provided to a selected SEB to implement and carry out a solicitation for bulk power purchases.

Assistance provided at the SEB level will be necessary in order to ensure rapid, effective implementation of the policy. Such TA activity at an SEB level would be integrated with the least cost planning activity (No. 5 outlined below) to determine local tariff features such as type of resource required and the appropriate pricing.

8) **R&M Support and Privatised Generation** - The capacity shortage throughout India is intensifying daily with shortfalls of nearly 20 percent in peaking capacity and 10 percent energy. Indicative of this situation is that fact that there have been at least 5 total grid collapses this several months. The need for new capacity is presently projected at nearly 1,000 MW per month over the next 5-6 years. Private sector initiatives underway are not expected to yield significant results until the 1999 or 2000, at which time the power shortage is expected to exceed 40% nationwide. Finally, new initiatives via the competitive bidding route will not realistically yield results until the year 2000 or thereafter.

B Interim Steps

Implementing the recommendations will require significant effort and resources to develop implementation plans, to make available finance, manage the implementation process, monitor progress, coordinate all training programs, and approve final actions. USAID/India must be aware of the need for action to take advantage of the opportunities identified. The direction and the extent of re-programming of the EMCAT must be determined based on the budgetary constraints of the project. The process of reaching agreement on the points of the evaluation is time consuming and there are some activities which all parties will agree need to be completed regardless of the outcome of this process. It is recommended that those activities commence immediately. The activities recommended for funding prior to this agreement are:

a) Standardisation of the PFC loan applications and loan application process

b) Completion of the Hydro PPA.

c) Scoping paper and background research on the bulk tariff.

d) Completion of the project appraisal manual along with on-the-job training in appraisal with special emphasis given to the role of credit analysis.

e) The Resident Advisor should begin the process of meeting with the SEBs to further refine the work needed in the above referenced areas.

PFC Comments: PFC had already evolved a work plan for 1995-96 but the same has been kept on hold under USAID advice pending the mid-term evaluation report and the decision thereon. Based on the mutual consultation and the decision, the work plan for the remaining portion of the project could be finalised incorporating changes int he thrust areas, and can be pursued. The Resident Advisor should work within the plan approved by the Project Review Committee.

SECTION 5: GENERAL PROJECT RECOMMENDATIONS

1. Project Assistance Completion Date.

It is recommended that the project be extended to December 31, 1999.

PFC Comments: We broadly agree to the general recommendations 1-5, subject to PFC's role being that of the implementing agency for the entire project rather than being only a client partner for 20% funding under the Project.

2. Manage EMCAT Components as if they are activities under one project rather than separate contracts.

The four separate contracts have much in common and will contribute to the SEBs in four distinct areas, including the renewable energy contract. But it is important that they have a unified approach. This will avoid duplication and lead to measures which reinforce each other's activities. The assist in this unification, USAID needs to start managing the contracts as one.

3. There is a need for strengthening USAID's role of supervising and supporting EMCAT project activities, particularly in the area of reviewing the Contractors services.

4. It is recommended that the remaining funds for the IDBI and PFC components be obligated.

5. More effort must be given to dissemination of project activities. The project could establish a quarterly newsletter which is circulated to the power sector. The newsletter could cover a wide variety topics and be used to acquaint readers with project activities and any other relevant activities of the SEBs, industry participants and interest institutions.

6. A representative of ASCI should become a member of the Project Review Committees.

PFC Comments: ASCI has been, can could be only one of the several institutes whose facilities are being availed of by PFC in providing training. In view of the role of PFC vis-a-vis ASCI in the Project as a whole as commented on above, the recommendation that a representative of ASCI should become member of the Project Review Committees is not acceptable.